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OF THE
UNIVERSITY OF MONTANA
30 APR 1915

Bulletin of the MONTANA STATE COLLEGE *of* AGRICULTURE *and* MECHANIC ARTS

FOUNDED EIGHTEEN HUNDRED NINETY-THREE
MADE A COMPONENT PART OF THE UNIVERSITY OF MONTANA
IN NINETEEN HUNDRED AND THIRTEEN

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Twenty-Second Annual Catalogue

1914-1915



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Montana
State College of Agriculture
and Mechanic Arts

Made a Component part of the
University of Montana

TYPOGRAPHICAL UNION LABEL BOZEMAN

Bozeman, Montana

Calendar

1915.

Six Weeks Summer Session Begins.....Monday, June 7
Registration and Examination for Entrance and Conditions
.....Monday and Tuesday, September 13 and 14
Instruction Begins.....8:00 A. M., Wednesday, September 15
Receptions by Christian Associations.....Friday, September 17
Faculty Reception to New Students.....Friday, September 24
Music Recital.....Friday, October 1
School of Agriculture Examinations, to Remove Conditions
.....Monday and Tuesday, October 4 and 5
School of Agriculture Begins.....Tuesday, October 5
School of Mechanic Arts (Three-year Course) begins Tuesday, Oct. 5
Traction and Stationary Engineer License Course begins
.....Tuesday, October 5
Columbus Day, a Holiday.....Tuesday, October 12
Standing of Students Reported.....Friday, October 29
Standing of Students in School of Agriculture Reported
.....Friday, November 12
Thanksgiving Recess..Thursday, Friday and Saturday, Nov. 25, 26, 27
School of Agriculture Examinations
.....Thursday and Friday, December 16 and 17
Freshman-Sophomore Debate Friday, December 17
Standing of Students Reported Saturday noon, December 18
Christmas Vacation.....Begins 12:00 M., Saturday, December 18

1916

Vacation Ends and Second Semester School of Agriculture
Begins 8:00 A. M., Tuesday, January 4
School of Agriculture Examinations to Remove Conditions
..... Monday and Tuesday, January 3 and 4
Semester Examinations Begin.....9:00 A. M., Monday, January 24
Declamatory Contest for Secondary Students...Thursday, January 27
Farmers' Week.....January 31 to February 5
First Semester Ends.....Friday, February 4
Examinations for Conditions..Friday and Saturday, February 4 and 5
Registration for Second Semester.....Tuesday, February 8
Lincoln's Birthday, a Holiday.....Saturday, February 12
Standing of Students in School of Agriculture Reported
.....Friday, February 18
Washington's Birthday, a Holiday Tuesday, February 22
Extemporaneous Speaking Contest.....Friday, February 25
Interscholastic Basket Ball Tournament
.....Thursday, Friday and Saturday, March 9, 10, 11
Standing of Students Reported Friday, March 17

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Stock and Grain Judging Contest (School of Agriculture) Monday, March 27
Commencement for the School of Agriculture.....Thursday, March 30
School of Agriculture Ends Friday, March 31
Oratorical Contest Friday, April 21
Standing of Students Reported Friday, April 28
Campus Day Saturday, May 6
Examinations begin.....9:00 A. M., Monday, May 29
Memorial Day, a Holiday Tuesday, May 30
Examinations for Conditions.....Friday and Saturday, June 2 and 3
Baccalaureate Address.....8:00 P. M., Sunday, June 4
Field Day 10:30 A. M., and 2:00 P. M., Monday, June 5
Music Recital 8:30 P. M., Monday, June 5
Class Day Exercises.....Tuesday, June 6
President's Reception 9:00 P. M., Tuesday, June 6
Commencement.....10:30 A. M., Wednesday, June 7
Alumni Meeting and Banquet.....Wednesday Evening, June 7
The Summer Session for 1916 will begin.....Monday, June 12

Montana State Board of Education

Ex-Officio

GOVERNOR S. V. STEWART, Chairman.....Helena
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STATE SUPT. H. A .DAVEE, Secretary.....Helena

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(Term Expires February, 1916.)
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JOHN DIETRICH.....Helena
(Term Expires February, 1917.)
CHARLES H. HALL Missoula
J. BRUCE KREMER.....Butte
(Term Expires February, 1918.)
LEO FAUST Libby
WARD H. NYE.....Billings
(Term expires February, 1919.)
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Instructor in French and Spanish.

*On leave of absence at Chicago University.

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M. ALDA SMITH, B. S., (Montana State College)
Instructor in Home Economics
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Instructor in Chemistry.
MRS. JEAN MARTIN, B. S., (Columbia University)
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FRED O. JACKSON,
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Band Instructor.
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Assistant in Engineering.
OSCAR TRETSVEN,
Assistant in Animal Husbandry.
G. OTTO ROMNEY, A. M., (Harvard University)
Assistant in History.
JAMES A. KEIFER, B. S., (Montana State College)
Assistant in Physics.
FRED C. HOMANN,
Assistant in Shops.
LOLA AILINGER,
Assistant in German.

Experiment Station

STATION STAFF

JAMES M. HAMILTON, M. S., President.
FREDERICK B. LINFIELD, B. S. A., Director.
ROBERT A. COOLEY, B. S., Entomologist.
ALFRED ATKINSON, M. S., Agronomist.
————————————, Animal Husbandman.
EDUMUND BURKE, B. S., Chemist and Meteorologist.
DEANE B. SWINGLE, M. S., Botanist and Bacteriologist.
ORVILLE B. WHIPPLE, B. S., Horticulturist.
HOWARD WELCH, D. V. M., Veterinarian.
WILLIAM F. SCHOPPE, M. S. Poultryman.
HARVEY E. MURDOCK, C. E., M. E., Agricultural Engineer.
JOSEPH B. NELSON, Assistant Agronomist.
REUBEN M. PINCKNEY, B. S., A. M., Assistant Chemist.
LEONARD F. GIESEKER, M. S. A., Assistant Agronomist.
H. ELWOOD MORRIS, B. S., Ass't. Botanist and Bacteriologist.
J. ROBERT PARKER, B. S., Assistant Entomologist.
GEORGE E. SMITH, B. A. S., Assistant Chemist.
EDWIN L. CURRIER, B. S., Assistant in Farm Management.
BURT W. WHITLOCK, B. S., Superintendent of Grain Laboratory
EDMOND J. QUINN, B S., Assistant Chemist.
RUSSELL R. DODDERIDGE, B. S., Ass't. Animal Husbandman.
CECIL C. STARRING, B. S., Assistant Horticulturist.
JOSEPH D. MORGAN, B. S., Assistant Grain Laboratory.

Agricultural Extension Service

EXTENSION STAFF.

JAMES M. HAMILTON, M. S., President.
FRED S. COOLEY, B. S., Director.
M. LINCOLN WILSON, B. S., State Leader of County Agriculturists.
WILLIAM J. HARTMAN, D. V. M., Livestock Specialist.
KATHERINE JENSEN, M. S., Home Economics Specialist.
HOWARD B. CANNON, M. S., Farm Efficiency Specialist.
AUGUSTA D. EVANS, B. A., Boys' and Girls' Clubs.
F. M. HILLMAN, B. S., Dairy Specialist.
CARL H. PETERSON, County Agriculturist, Fergus County, Lewistown, Montana.
JOHN CHARLES TAYLOR, B. S., County Agriculturist, Wibaux and Fallon Counties, Wibaux, Montana.
RALPH A BLANCHARD, B. S., County Agriculturist, Cascade County, Great Falls, Montana.

CHARLES L. HANSEN, B. S., County Agriculturist, Missoula County, Missoula, Montana.
GEORGE H. COOK, B. S., County Agriculturist, Gallatin County, Bozeman, Montana.
F. JOSIAH CHASE, B. S., County Agriculturist, Custer County, Miles City, Montana.

STANDING COMMITTEES

ASSEMBLY—Hamilton, Bishop, Gilruth.
ATHLETICS—Swingle, Bennion, Tallman.
BUILDINGS AND GROUNDS—Linfield, Richter, Whipple.
COMMENCEMENT—Hamilton, McNeely, Miss Baldwin.
PUBLICATIONS—Brewer, Atkinson, Cobleigh.
REGISTRATION—Ham, Miss Brewer, Holst.
SCHEDULE—Tallman, Cooley, Conkling.
STUDENT AFFAIRS—Miss Brewer, Spaulding, Mrs. Herrick, Whitcomb, Miss Cehrs.
RECOMMENDATIONS FOR POSITIONS—Richter, Miss Harkins, Burke.
GRADUATE STUDIES—Cooley, Atkinson, Thaler.
ABSENCE COMMITTEE—Atkinson, Mrs. Herrick, Richter.
ELIGIBILITY—Gilruth, Jennison, Wilson.

Experiment Station

In connection with the college, the Montana Agricultural Experiment Station is conducted. The object of this station is to further the interests of the agricultural industries of the State of Montana. This is done by conducting researches and experiments, which may include the physiology of plants and animals; the diseases to which they are severally subject, with remedies for the same; the chemical composition of useful plants at their various stages of growth; the various subjects connected with irrigation; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soil and water; the chemical composition of manures, natural and artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly upon the agricultural industry of Montana as may seem advisable.

The experiment station farm, consisting of 380 acres, adjoins the college grounds. It is provided with the necessary barns, granaries, tool houses, farm implements, livestock, gardens, greenhouses and orchards.

Sub-stations for experimental work in dry farming are maintained in various parts of the state and are conducted independently or in co-operation with the United States Department of Agriculture. A sub-station for experiments in horticulture has been established in the western part of the state.

The Montana Experiment Station is supported by the annual appropriations from the Federal Government under the Hatch and Adams Acts, supplemented by growing appropriations from the state.

The station issues during the year a series of bulletins, which put in practical form the results of the experimental work. These are sent upon request, to any citizen of Montana who will apply for them, and any such may have his name entered upon a mailing list and receive all bulletins as soon as issued.

Address, Director, Experiment Station, Bozeman, Montana.

Agricultural Extension Service

The purpose of agricultural extension service is to take agricultural science and experience out to farms and farm homes for the assistance of the people. The fruits of experiment and research; the formulated sciences of agriculture, biology, chemistry, physics and home economics as applied to country life, and the best farm experience are the foundation for this extension teaching. These are construed broadly to include the economic, business, social, educational, aesthetic, and ethical as well as strictly productive phases of country life. Home economics and household arts are included with agriculture in this extension service.

From a beginning with a single officer in charge of extension service and temporary assistance secured from the college, experiment station, and outside sources, a permanent division has been created with a director and assistants who are specialists in animal husbandry, home economics, horticulture, agronomy, rural education, and an office force. To this staff of extension workers for statewide service is being rapidly added a corps of county demonstrators in agricultural and home economics, whose work is personal and direct within a limited territory. These county demonstrators are working concertedly under direction of the State extension office in co-operation with the Federal agricultural organization. Members of the college faculty and experiment station staff devote a considerable time to extension service.

The extension equipment at present consists chiefly in a comprehensive agricultural library, stereopticon slides, charts, Babcock testers,

and other illustrative and demonstrative material. For extension service in schools, at fairs, on better farming trains and elsewhere, the resources of the college and experiment station are freely drawn upon. Livestock, machinery, scientific apparatus, as well as agricultural, biological and chemical collections, are available for such instruction.

Among the more important lines of extension work are:

I. **Farmers' Institutes:** Meetings of farm people addressed by speakers of established reputation, for purposes of instruction and inspiration.

II. **Correspondence:** Instruction by mail, through the press, and by reading and correspondence courses. Reading matter containing information of current interest along the lines of agriculture and home economics is sent weekly to all the papers of the state.

III. **Movable Schools:** Located for the convenience of farmers for systematic instruction by qualified teachers. These schools each have the services of from four to six instructors and their average duration is one week.

IV. **Better Farming Trains:** Operated in co-operation with railroad companies. These trains carry several cars of illustrative and demonstrative material, and corps of fifteen to twenty instructors.

V. **Fairs:** The educational value of the country fair is being enhanced by trained judges furnished by the extension office and by demonstration exhibits.

VI. **High School Lectures and Lecture Courses:** Seventy-five to one hundred lectures in applied science given yearly to Montana high schools. Their purpose is to give instruction in agriculture, home economics, and applied science, adapted to pupils of secondary grade.

VII. **Rural Education:** Assisting the present educational system in co-ordinating rural education with country life, introducing agriculture into the rural curriculum, and enhancing the value of country schools.

VIII. **Industrial Clubs:** These engage boys and girls in practical enterprises, such as corn contests, potato contests, sewing contests, canned fruit contests, etc., etc. The winners in these county contests are taken to the state fair and entertained and taught under the supervision of college officers.

IX. **County Agriculturists:** In co-operation with the Federal government and counties of the State, agents are located to assist farmers personally in solving local problems of production, marketing, and country life. The extension service seeks to co-ordinate all forces that are at work for rural betterment, whether industrial, business, educational, social, or religious, and to co-operate with them for the greatest efficiency in such service.

Engineering Extension Work

The College of Engineering Extension Work has been inaugurated in order to give engineering instruction to those who desire information along engineering lines and who have not the time or the opportunity to attend the college. The courses, arranged so as to aid those engaged in practical work, consist of lectures, discussions, recitations, drawing, etc. When a sufficient number apply for one or more courses, classes are organized and an engineering instructor visits the classes, once a week, to lecture or to conduct class recitations. In this way the student comes in direct contact with the instructor. Among the courses offered are the following:

I. **Shop Calculations:** Calculations of shop problems; size of gear, pulleys, etc.

II. **Drawing, Course 1:** Instruction in the use of instruments, lettering and projections.

III. **Drawing, Course 2:** Development of surfaces and the drawing of simple machine parts.

IV. **Design of Simple Structures:** Determination of stresses in simple structures, including the design of a simple truss in wood and steel. Especially adapted to the needs of carpenters, builders and contractors.

V. **Valve Gears:** A study of valve movements as applied to locomotive and other engines. The Zeuner diagram.

VI. **Electrical Machinery:** Direct currents, a study of the construction and operation of direct current machinery.

VII. **Electrical Machinery:** Alternating currents, a study of the construction and operation of alternating current machinery.

VIII. **Heat and Steam:** Nature of heat, use of steam table, efficiency of the perfect engine, compounding, jacketing, superheating.

IX. **Internal Combustion Engines:** Gas, gasoline and producer gas engines, gas producers.

State College of Agriculture and Mechanic Arts

The purpose of the colleges of agriculture and mechanic arts is chiefly to provide industrial education in agriculture, engineering, household economy, and applied science, for the young men and women of the respective states in which they are located. The scope of the Montana State College is set forth in the two so-called Morrill Acts of Congress, which authorized this class of institutions and supplied in part endowment and funds for maintenance; and in an act of the Montana Legislature accepting the land and money grants from the national government.

The first Morrill Act of Congress of July 2, 1862, making a land grant for the partial endowment of the agricultural and mechanical colleges, states that the income from these lands shall be used to maintain colleges "where the leading object shall be, without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislators of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

The second Morrill Act of Congress, August 30, 1890, making an annual appropriation out of the treasury of the United States for the further support and endowment of these colleges, provides that this fund is "to be applied only to instruction in agriculture and mechanic arts, the English language, and the various branches of mathematical, physical, natural and economic sciences, with special reference to their application to the industries of life; and to the facilities for such instruction."

The Act of the Montana Legislature, approved February 16, 1893 accepts these grants of lands and money and provides that the Montana State College shall have for its object, "Instruction and education in the English language, literature and mathematics, civil and mechanical engineering, agricultural chemistry, animal and vegetable anatomy and physiology, the veterinary art, entomology, geology and such other natural sciences as may be prescribed by the State Board of Education; political, rural and household economy, agriculture, horticulture, history, bookkeeping, and especially the application of science and the mechanical arts to practical agriculture in the field, and irrigation and the use of water for agricultural purposes."

The Thirteenth Legislative Assembly passed an Act which provides that the State University of Missoula, the College of Agriculture

and Mechanic Arts at Bozeman, the School of Mines at Butte, and the Normal School at Dillon shall constitute the University of Montana. The control and supervision is vested in the State Board of Education, which appoints the president, faculty and such other officers and employees for each of the various institutions of the University of Montana as the said Board may deem necessary. Degrees and diplomas shall run from the University of Montana and must specify substantially the course of study which the graduate has completed.

ENDOWMENT.

The Enabling Act, providing for the admission of Montana into the Union, approved February 22, 1889, Sec. 16, grants 90,000 acres of land to Montana for the use and support of an agricultural college according to the terms of the Act of Congress, July 2, 1862, and Sec. 17 grants an additional 50,000 for the same purposes, and subject to the same conditions and limitations as the other grant. The 140,000 acres of land cannot be sold for a price less than $10.00 per acre, and the principal, together with all money received from the sale of timber, is to be invested as a permanent endowment. The unsold lands may be leased and the rentals, together with the interest on the permanent endowment, shall be used for the maintenance of the college.

The Act of Congress of August 30, 1890, appropriates $25,000 annually out of the treasury of the United States. By the Nelson bill, passed March 3, 1907, this amount was increased annually by $5,000 each year, beginning in 1907, until now the total annual appropriation has reached $50,000, at which figure it is to remain.

LOCATION.

Bozeman, the county seat of Gallatin county, is on the main line of the Northern Pacific railroad, and on a branch of the Chicago, Milwaukee and Puget Sound railroad. For convenience, healthfulness and beauty of surroundings, the location is unsurpassed. The college is situated on an elevation which commands a view of one of the most fertile valleys in the world, covered far and wide with grain fields, and hemmed in on all sides by lofty mountains.

Bozeman is a city of homes and churches, with a wholesome moral environment. It is a most desirable residence city for families who wish to educate their children. Expenses are moderate and there are all the conveniences of a modern city. The college is reached from the railroad stations and city by the electric car line.

CAMPUS AND FARM.

The grounds and farm contain three hundred and eighty acres. Forty acres in the immediate vicinity of the buildings constitute the

campus and recreation grounds, which are in lawn, interspersed with flower beds, shrubbery, trees and driveways. The remainder is used for farming and experimental purposes.

BUILDINGS.

Montana Hall—Situated in the center of the college campus, is a substantial structure of brick and stone, having a total length of one hundred and twenty-eight feet and a width of ninety feet. It is three stories high, and has a basement, which furnishes quarters for mechanical drawing and two class rooms. On the first floor are offices for the president, secretary and registrar, one room each for the Young Men's and the Young Women's Christian associations, a class room, and the south half of the first floor contains the reading room and library, and an office for the librarian. The north half of the second floor is devoted to the art department, the arrangement being such that three large rooms can be thrown together by sliding doors. The south half of the second floor has one office and four recitation rooms. The third floor contains the large assembly hall and seven class and music rooms.

Hamilton Hall—Is the dormitory for women. It was named by the faculty for the late Mrs. James M. Hamilton. It is one hundred twenty by fifty-eight feet, three stories and basement. It is constructed of brick with hard wood floors and Oregon fir finish. It is equipped with steam heat, electric lights and baths. The rooms are single and in suites, and all rooms have both hot and cold water. In the basement are the store rooms, laundry, quarters for servants, kitchen and large dining room. The first floor contains the reception rooms, the dean's suite, guest room and a number of rooms for students. The second and third floors are for students.

Agricultural Hall—Is a three-story building, one hundred and fifty feet by sixty-eight feet, pressed brick, tile roof, maple floors and modern equipment throughout. The north half of the first floor contains the quarters for dairying, consisting of storerooms, office, class room, butter and cheese rooms and laboratories. The south half of this floor is used for horticulture and has seed room, office, class room, work room and laboratory. The north half of the second floor is occupied by the agronomy department, with office, class room, dry land office, soil and grain laboratories. In the south half are offices for the director of the experiment station, superintendent of farmers' institutes, class room, office and laboratory for the department of animal industry. The third floor is devoted to home economics, and contains two large kitchen laboratories, two dining rooms, two class rooms, three sewing rooms, offices and one room for training in nursing.

Adjoining the Agricultural Hall on the south is the new greenhouse with iron frame, cement floors and modern construction throughout.

In the center of the front is a palm room 39 feet square and on both sides flower and vegetable rooms, 28 by 25 feet. Through the center is a plant breeding room, 98 by 20 feet, and on the west side a propagating room, 98 by 9 feet. The entire house is 98 feet by 68 feet, and joined to the agricultural building by a brick work room, 57 by 10 feet.

The Chemistry and Physics Building is located west of Montana Hall. It is 60 by 100 feet, of pressed brick, and is three stories high, including the basement. The basement is occupied by the physics lecture room, chemistry lecture room and laboratory, the mineralogical and assay laboratory, and the museum of geology and mineralogy. The main floor is occupied by the office and department library, a lecture room, the food laboratory and the experiment station laboratory. The east half of the second story contains the laboratories for physics, and the west half the qualitive and quantitive laboratories.

The Biology Building, consisting of three stories and basement is brick veneered. On the top floor is a lecture room and a museum containing the zoological collections. On the floor below are three laboratories for bacteriology, botany and zoology, and an office and work room for the botanist. The west half of the first floor is a large laboratory for general biology, and the east half is occupied by the office, library and work room for the entomologist. The basement contains work rooms, class room, store rooms, herbarium room, and dark room. Attached to this building on the south is a greenhouse, 72 by 50 feet, for botanical purposes, and an insectary, 18 by 10 feet, for the study of living insects. The green house is divided into two rooms, one for eperimental work and the other for laboratory use.

The Engineering Laboratory is a two-story building 94 by 35 feet, with a frame annex 36 by 20 feet. The first floor contains the dynamos, motors, and other machinery and apparatus, offices and students' reading room. The second story is occupied by the storage battery, photometer and electric light rooms, class rooms and offices. The first floor of the annex contains the cement laboratories, and the second floor is used for electrical designing. There is also laboratory space 43 by 144 feet, occupied by materials, testing machines, a refrigerating machine, various steam and gas engines, steam and oil tractors, etc. Adjoining the laboratory on the west is a brick building, 76 by 32 feet. It contains a 125 horsepower Stirling water-tube boiler, and 125 horsepower Root water-tube boiler. An 85 horsepower engine is directly connected with a 40 K.W. dynamo to furnish power for electric lights, the ventilating fans and the shops. There is also a 16 horsepower vertical type of engine and a 10 horsepower engine, which drives the fan for the power house stack.

The Shops are in a one-story frame building. The main part is 60 by 100 feet and contains a forge shop, 27 by 60 feet, a machine shop, 44 by 72, an office, a wash room, and a tool room. It has one wing 36 by 50 feet for woodwork, and another 36 by 48 feet for foundry.

The Gymnasium is a frame building. The main part is 100 by 60 feet, has hard wood floor, and on the ends and sides are permanent seats, amphitheater style. It furnishes a convenient place for gymnasium practice, basket ball and other indoor athletics. An addition at the rear and sides, 90 by 14 feet, provides a director's office, two locker rooms, dressing room for women, shower and needle bath rooms, and a material room.

The Cattle Barn is a two- story frame building 120 by 82 feet, and of fine architectural appearance. On the first floor is the dairy stable, quarters for young stock, a stock judging room, 40 by 40 feet, box stalls, feed bins and offices. The second story is used for storage of hay. All stables have cement floors and iron stalls.

The Veterinary Building is a two-story frame structure, 25 by 40 feet, with a one-story wing, 20 by 40 feet. On the first floor are the office of the veterinarian, two laboratories and an operating room. The second floor contains a laboratory and a class room.

The Horse Barn is a two-story frame building, 86 by 44 feet. It contains a living room, carriage room, feed bins, fourteen single stalls, three double box stalls, and space for 100 tons of hay.

The Beef Cattle Barn is 50 feet square, with two wings each 24 by 28. It is equipped for feeding experiments and has feeding pens, space for hay, grain bins and weighing room.

The Sheep Barn has a main part, 40 by 50 feet, and two wings, one 20 by 72 feet, the other 20 by 88 feet. In addition to the pens this building is provided with root cellar, wool and shearing rooms, hay loft, feed bins, and room for the attendant.

The Seed Barn and Granary is a two-story building and affords ample storage room for the field crops on the station farm.

The Piggery consists of a main building, 30 by 35 feet, with two wings, 16 by 50 feet each. In the main building are the feeding rooms and slaughter room, while the wings provide six pens each, for the hogs.

The Poultry Plant consists of two buildings. One is 122 by 15 feet, with a center extension 40 by 20 feet. The center contains the feed room, office, laboratory and living room. Underneath is the incubator cellar. One wing is a brooder house and the other has six pens with yards. The other house is 120 feet long and provides eight pens.

HAMILTON HALL.

Hamilton Hall is the college home for women. This building is completely furnished. All modern conveniences, such as hot and cold water in the rooms, baths, steam heat and electric lights, are furnished. The Hall is under the supervision of the dean of women and the residents have the care and training necessary for a family of students. The price of rooms (including board) varies according to location and size of room:

One in single room	$24.00
Two in single room (each)	22.50
One in double room	26.00
Two in double room (each)	23.00
Two en suite (each)	26.00
Three en suite (each)	24.00

The above prices are for a calendar month. Of these amounts $18.00 is for table board and the remainder for room rent. Application for rooms in the hall may be made at any time to the dean of women, or to the secretary of the college and must always be accompanied by a deposit of $5.00 to insure a reservation. This amount will apply toward payment of bills in the fall or will be returned if the secretary is notified before September 1. Residents who leave the Hall before the close of the semester will be required to pay the room rent till the end of the semester. Payment for room and board must be made on the fifteenth of every month in advance, and after five days thereafter an extra charge of $1.00 per week will be made as long as the bill remains unpaid, unless arrangements have been made to defer payment. Complete arrangements are made for the reception of the residents the day before registration day, and no deduction will be made for late arrivals. The Hall will not be open for occupancy until the day before registration day. No deduction is made for absence at week ends or during vacations, except at the Christmas holidays, when room rent only will be paid. The residents may have guests at meals by making arrangements for same at the dean's office, the day before, and may also have the privilege of the laundry on Saturdays by paying a small fee. The residents are expected to furnish their own towel supply, dresser and table scarfs, and have same laundered; also a napkin ring and any room decorations they may fancy.

ROOM AND BOARD FOR MEN

There is no men's dormitory connected with the college. Students who do not live in Bozeman find room and board in private families convenient to the college, at from $22.00 to $25.00 per month. The total college expense for the year, including tuition, books, room, board and incidental expenses may be estimated from $250.00 to $350.00. A list of approved places with prices and accommodations is kept in the registrar's office. A committee of students meets all trains on registration days and at other times on request, and aids in finding satisfactory locations. Students arriving in Bozeman in the day time should take the car from the depot to the college.

LUNCH COUNTER

A room on the top floor of the agricultural building, adjoining the

College Union rooms is used for a lunch counter. All students and others who desire to take their meals at the lunch room are served at a very reasonable expense.

FEES*

1—Annual matriculation fee for college, art, and school of home economics and mechanic arts courses	$12.00
2—Annual matriculation fee for school of agriculture and other three-year courses	6.00
3—Extra fee for late registration	$2.00 or 4.00
4—Special fee for removing condition caused by absence	2.00

DEPOSITS*

Agriculture—Agronomy (2) per semester	$ 2.00
Animal Industry (21), (22), (f), (j) per semester	2.00
Horticulture (1) per semester	1.50
Horticulture (4) per semester	5.00
Horticulture (6), (a) per semester	1.00
ART—Art (4), (6), (8a), (8c), (9), (15), (16), (17). (a) or (b) per semester	1.00
Art (1), (7) per semester	1.50
Art (7a), (7b), (8b) per semester	2.00
Art (2), (3), (3a), (8), (13), (14) per semester	3.00
Art (10), (11), (12) per semester	5.00
BIOLOGY—Biology (a) or (c) per semester	1.50
Biology (4), (5), (6), (7), (9), or (17) per semester	2.00
Biology (12), per semester	7.00
Biology (10) per semester	6.00
Biology (1), (2), (3), (11), or (13) per semester	3.00
CHEMISTRY—Chemistry (1) per year	8.00
Chemistry (2), (3), (4), (5), (7), (8), (14), (17), (18), per semester	8.00
Chemistry (11) per semester	6.00
ENGINEERING—C. E., (1), (1a), (2), (4), (9), (14), (15), (21), (28), (29), (30), (32), per semester	1.50
C. E., (8), (34) per semester	2.00
E. E. (4), (6), (10), or (12), per semester	3.50
M. E., (6), (14), (15a), (17), (21), (27) per semester	2.00
M. E. (4), (4a) per semester	1.50
M. E., (2), (9) per semester	2.50
M. E., (2a) per semester	1.00
M. E., (20), (28), per semester	5.00
A. E., (4), (6), (7), (17) per semester	1.00
MECHANIC ARTS—M. A., (e) per year	4.00
M. A. (b) per semester	5.00

M. A. (c), (r) per semester	2.00
M. A. (d), (h) per year	3.00
M. A., (f) per year	4.50
M. A., (k), (l), (m), (n), (o) per year	1.00
M. A. (s) per semester	3.00
M. A. (a) per semester	4.00
HOME ECONOMICS—H. E. (1), (5), (6) per semester	4.00
H. E. (2), (4) per semester	5.00
H. E. (13), (c), (b) per semester	1.50
H. E. (15), (16), (d) per semester	.75
H. E. (3), (7), (12), (14) per semester	.50
H. E. (g) per year	6.00
H. E. (11) per semester	2.00
H. E. (a) per semester	1.00
H. E. (h) per semester	5.00
H. E. (j) per year	.50
PHYSICS—Physics (a) per year	1.00
Physics (1a) per semester	2.00
Physics (2) per year	3.00
Physics (4), (9) per semester	2.00
Physics (5) per semester	3.00
TYPEWRITING (3) or (4) for use of machine for one year	5.00

*A fee is a fixed charge and no part is returned. The deposits cover the cost of materials and breakage in the laboratories and any unused balance is returned.

ADMISSION.

Admission to the freshman class, in any of the college courses, is granted: (a) By a certificate of graduation from an accredited high school. (b) By examination in the subjects required by the college for entrance. (c) By faculty approval of grades from other than accredited high schools. (d) By graduation from the school of home economics and mechanic arts.

Candidates for admission to the school of home economics and mechanic arts and the school of agriculture must have completed the eighth grade in public schools or its equivalent. There are no set requirements for music and the short agricultural courses, all being admitted who give evidence of being able to profit by the work. All candidates for admission to the institution in any department whatever are required to present the requisite diplomas or certificates for work previously done in other schools, and no registration is complete until such credentials are presented and passed upon.

ENTRANCE REQUIREMENTS.

Fifteen units are required for admission to the freshman class in any college course.

Any one with not less than thirteen units may be admitted conditionally, but the units of preparatory work which have not been offered at entrance must be given preference over college subjects.

A unit for admission shall consist of work to the amount of five recitation periods per week of forty-five minutes each or four recitation periods per week of sixty minutes each, for a year of not less than thirty-six weeks.

Two periods of laboratory, shop work, or drawing shall count as one recitation.

In accordance with the present rules of the State Board of Education the following are required of all applicants for admission without condition to the freshman classes:

1—English composition and literature, 4 units.
2—Language other than English, 2 units.
3—Mathematics, 2 units.
4—Science, 1 unit.
5—History, 1 unit.

The remaining units will be selected from the following:

1—Language other than English, 4 units.
2—Mathematics, 2 units.
3—Science, 3 units.
4—History, including civics and economics, 3 units.
5—Drawing, 2 units.
6—Commercial subjects, 4 units.
7—Industrial subjects, including home economics, mechanic arts and agriculture, 6 units.

Admission without condition to the courses in engineering requires three years of mathematics and one year of physics.

REGISTRATION.

Matriculation.—Students entering the college for the first time must present their credentials or pass examination to determine their standing; and until such credentials are passed upon by the registrar or until examinations are passed in the subjects which may be required, the applicant for admission will ordinarily not be admitted to class work. This means that graduates of accredited high schools must bring to the college a recommendation certificate (forms will be furnished by the registrar), showing just what subjects credit is asked for, just how much time was given to such subjects and the grades attained. In addition to this, graduates from high schools not accredited may be required to pass examinations in the subjects offered. In the case of graduates from the eighth grade of the

common schools, the certificate of examination must be brought to the college.

Time for Registration.—The time set for registration of students is the first Monday and Tuesday of the first semester, and the first Tuesday of the second semester. The class room work begins on the first Wednesday morning of each semester. No students will be registered on Wednesday, Thursday or Friday of the first week of each semester, except at the convenience of class officers between four and five in the afternoon. Those who fail to present themselves for registration before the first Wednesday in either semester, will be permitted to register later in the first week, only upon the payment of a special fee of $2.00, in addition to regular fees. Those who apply for registration after the end of the first week of each semester will be registered only upon payment of a special fee of $4.00 in addition to the regular fees. All special fees so collected shall go into the miscellaneous college fund. The faculty may at its discretion refund the special fee of any student, after the third month of the semester, upon definite proof that the tardy registration was necessary.

HOW TO REGISTER.

I. All students who have registered here before—except graduates of the preparatory department registering as freshmen—will go directly to their class officers and obtain a class entrance card.

II. Those who have not registered here before and graduates of the secondary school will:

(1) Fill out application blank.
(2) Secure the signature of the registrar.
(3) Take this signed application blank to the class officer in whose course registration is desired.
(4) From him secure a class entrance card.
(5) All women report to the office of the Dean of Women at Hamilton Hall.

III. Present class entrance card at the office of the registrar for approval.

IV. After securing the approval of the registrar pay fees at the secretary's office.

Unless permission is granted by the faculty, class officers will register all students in accordance with the rules governing prerequisites, failures and number of credits. The registrar will examine all credentials for admission, and all grades earned in this and other institutions and report any irregularities in registration to the faculty. No registration shall be considered final until approved by the registration committee or the faculty.

Amount and Regularity of Work.—Students under twenty-one years of age will be admitted only to regular courses or to work as nearly regular as their preparation allows, unless on special action of

the faculty. Students over twenty-one will be admitted to such work, not less than twelve credits (allowance being made for music), as the schedule permits and their class officers approve, and the twelve credits, shall include at least six credits of lecture or recitation work.

Change of Registration.—A student desiring to change his studies will present his request to his class officer, who, after consulting all teachers interested, will take such action as he may deem best. Change in registration will be made after four weeks for extraordinary reasons only. Requests for change in registration will not be considered during the last eight weeks of a semester. A change in course of study is allowed by a vote of the faculty only.

Credits Necessary for Registration.—It is the sense of the faculty that any student not passing in ten credits is wasting his time, and ordinarily he will not be re-registered when he has failed to pass in ten credits the preceding semester.

Registration by Mail.—Most of the details of registration can be arranged in advance by mail, and students are requested to arrange their work so far as possible in this way. Those who enter the institution for the first time should write several days in advance of the college opening, enclosing their credentials, as specified in the paragraph on matriculation above, to the registrar of the college, and should state the work which they wish to take. These documents will be examined and the student's classification ordinarily be determined before his arrival, so that much time in registration may be saved. Those who have been already enrolled in the institution should send a letter to their class officers several days in advance of the registration days, telling clearly the work which they plan to take, and in case of elective subjects, stating briefly the reasons for their choice.

If these steps are taken by students, registration should be completed with a minimum expenditure of time; but no student's registration will be complete until he applies at the college in person.

Students who plan to arrange their registration by mail, as specified above, should study carefully the entrance requirements for the courses in which they are interested, and the prerequisites to the various subjcts which they wish to take up.

Absences.—Students absent from required exercises are reported at the close of each day to the registrar's office.

In case of absence students must appear before the class attendance committee and be given an absence excuse card before being admitted to the class the second day after the absence occurs. In the case of frequent, unwarranted absences, the committee shall bring the case before the faculty for discipline.

The committee, or one of its number, meet daily, except Saturday, between the hours of 3:50 and 4:10 p. m. at the office of the registrar for the purpose of considering absences.

These regulations apply to all students in the institution below the grade of junior.

Class absences of juniors and seniors will not be reported until the instructor feels that members of these classes are willfully remaining away from class and so wasting their time, and then these are to be reported to the absence committee for consideration and discipline recommendations to the faculty.

The instructors deal with tardiness in such manner as they deem best.

Leave of Absence.—When it is necessary for a student to be absent from the city, application must be made to the president for leave of absence. A leave of absence is justification for absence from class, but does not give relief from the work omitted.

GRADES.

Passing Grades.—Passing grades are marked A, B, C or D. An average standing from 90 to 100 is A, from 80 to 90 is B, from 70 to 80 is C, and from 60 to 70 is D.

Conditions and Failures.—Work not of a passing grade shall be marked E, if in the judgment of the instructor it can be made up or completed without repeating the course in class. Work not of a passing grade shall be marked F, if in the judgment of the instructor it cannot be made up or completed without repeating the course in class. A mark of E is a condition and may be removed by an examination or in such other manner as the instructor may prescribe. Examinations for removing conditions shall be held on the days designated in the college calendar. A mark of F is a failure and must be made up by repeating the subject in class. When a condition is not removed by the time the subject is offered the following year it lapses into a failure. The above marks apply to laboratory, shop work, drawing and other exercises, as well as to lecture and recitation courses.

Students whose work is unsatisfactory will be reported to the class officer and the president, and information will be sent to the parents or guardians.

Credits.—For convenience in estimating the requirements for a degree, the following rules are laid down: One hour a week, for a semester, of recitation or lecture work, or two and one-half hours a week for a semester of laboratory, shop, library work, or drawing, shall count as one credit.

If for any reason the full time is not occupied in the shop, laboratory, drawing room or library, the remainder shall be used under the supervision of the instructor for outside work.

No regular student may take in any one semester work amounting to less than twelve credits, nor more than nineteen, unless a greater number are prescribed in the course.

Grades brought by a student from another institution will be accredited in this college only after personal conference with and approval by the head of the department in which credit is desired. Students must present note books for work in which they have had laboratory courses and desire advance credit.

GRADUATION AND DEGREES.

Bachelor's Degree.—Candidates for the bachelor's degree must complete satisfactorily one of the college courses as outlined and not less than 130 credits; including also a thesis the value of which in credits shall be determined by the instructor concerned. Students who are relieved for any reason of the requirements in military drill or physical education shall present four additional credits in some other subjects.

The degree of Bachelor of Science is conferred upon students completing the work prescribed in any one of the college courses and the name of the course taken is placed on the diploma.

In order to complete a course satisfactorily and receive a degree a student must earn as many points as there are credits in the course. In calculating points, A grades count three times as many points as credits, B grades two times, C grades only one and D grades zero.

All students whose points are two and one-fourth times the number of credits at the time of graduation will receive the degree "With Honors."

Master's Degree.—Master's degree work is offered by some departments of the college, and this may be arranged by conferences with the professor in charge. For admission to this, the candidate must hold a Bachelor's Degree from this college or another of at least equal rank, and in the line of work for which he applies for Master's Degree, he shall have sufficient preparation in his major subject to enable him to carry on independent investigations. He shall complete a full year of resident study.

There shall be one major subject and one or two minor subjects. At least one-half of the work must be done in the major subject. The plan of the work must be approved by the Faculty Committee on Graduate work by October 1. The candidate shall also present a thesis embodying the results of independent investigation, which may be a part of the credits required for the major subject. He shall also pass an oral examination on his graduate work before a committee of not lss than five members representing the departments offering his major and minor subjects and two or more allied departments.

Engineering Degrees.—Resident graduates in engineering may earn the degree of Civil Engineer, or Electrical Engineer, or of Mechanical Engineer on the same basis as candidates earn the degree of Master of Science. Non-resident graduates in engineering must have at least three years of successful professional experience, must

present an acceptable thesis, and must pass an examination before the special committee on degrees.

MISCELLANEOUS.

Government.—Students are expected to conduct themselves as ladies and gentlemen; those who fail to comply with this demand will be requested to leave the institution.

Work for Exhibition.—It is required that students who have done work suitable for exhibition purposes shall place such work at the disposal of the institution for the period of one year.

Student Organizations.—All public performances, given by students or student organizations, using the name of the college, will be under the supervision of the committee on student affairs.

So far as possible all college gatherings will be held on Friday and Saturday evening. This includes class and student organizations. Students will not be out evenings from Monday to Friday except to attend something of unusual interest and value.

Eligibility for Athletics.—The rules governing eligibility of players shall be the same for all athletic contests in which any team plays an officially scheduled contest under the name of the college, whether the game be with another college, a club, or a secondary school. Each student representing this institution in intercollegiate contests must be pursuing regular work in this institution, and must be passing up to the week of the contest in at least twelve credit hours.

Military Drill.—All male students, except aliens, those physically disqualified, members of the junior and senior classes, and student assistants, are required to take military drill, satisfactory work being requisite for graduation.

Military drill is in charge of a United States army officer and a minimum of two years' drill is required. Each student in military drill must provide himself with a uniform, which is purchased through the secretary of the college, and costs about fifteen dollars.

If military drill is not given, physical education (1) will be required of all freshmen, and physical education (3) of all sophomores.

Students who are relieved for any reason of the requirements in military drill or physical education shall present four additional credits in some other subject; but the president may, at his discretion, excuse from such requirements any student in the employ of the institution.

Music as an Elective.—Music to a total of not more than four credits may be counted toward a degree in those courses which allow free electives. To those regular students who elect music the college will furnish free one thirty-minute lesson a week during the junior and senior years, or either semester of either year; and the work may be elected in either vocal or instrumental music.

Assembly.—Students are required to attend the assemblies held

on the second and fourth Fridays of each month and all special assemblies. The programs at these assemblies consists of addresses, music recitals, illustrated lectures, etc. Meetings of student organizations are held on the first and third Fridays of each month.

Honorable Dismissal.—Students intending to sever their connection with the institution, either indefinitely or permanently, should report as soon as possible to the president, either in person or in writing, giving proper explanation, and should apply for an honorable dismissal. Students leaving the institution without such honorable dismissal (except at the end of the college year), will not be readmitted to the college at any later time, nor will any reports or grades in credit for work done here be sent out until satisfactory explanation is made.

COLLEGE ORGANIZATIONS.

Young Men's Christian Association.—The association is undenominational and is well fitted to promote the moral and religious life of students. It conducts mission and Bible study courses, and prayer meetings and secures addresses by religious workers. The association promotes good fellowship by giving social entertainments, assists new members to get started in college life and aids in securing employment for those who wish to work their way through college.

Young Women's Christian Association.—The object of this association is the symmetrical development of Christian womanhood and the rendering of social service. To this end it conducts devotional meetings, Bible and mission study classes, and carries on an employment bureau for college women; homes are found where college women may receive their board and room in return for their services. This work is being standardized and will be supervised by the home economics seniors of the Y. W. C. A. The Y. W. C. A. co-operates with the Y. M. C. A. in social and religious work among the students. Each year it sends delegates to the Northwest Conference and keeps in touch with the state, national and international associations.

Debating Council.—The management of the work in inter-class and intercollegiate debating, in extemporaneous speaking, and in oratory, is now vested in a debating council, which works in co-operation with the department of English. Annual debates are now held with the Agricultural College of Utah, and the State University, and with the Gonzaga University. There is an established debate each year between the freshman and sophomore classes. There is a state contest in oratory and extemporaneous address in which five institutions of the state participate.

The Exponent.—The students of the college maintain an excellent weekly paper, The Exponent, which has also a monthly literary supplement. The paper is well supported by the students and outside advertisers and has become one of the most important and successful

of student enterprises. It compares favorably with the best college publications in the United States and affords the members of the staff very valuable literary training.

The Jack o'Lantern Club.—The purpose of this club of students is the studying and presenting of the modern drama. The work is done under the direction of the English department.

Athletic Council.—This organization, composed of representatives from the faculty, student body, and alumni association has general control over all branches of athletics. Football, basket ball, baseball, track and tennis are at present recognized.

The Handicraft Club.—This club was organized for those students who are interested in the crafts. The club meets every two weeks in the art department, and members work out original problems in their chosen craft. Members work for their own pleasure and benefit and are privileged to take orders.

Branch of the American Institute of Electrical Engineers.—A branch of this society has been organized at the college. Regular monthly meetings are held at which original papers are read or those of the Institute discussed. Students and teachers are kept in touch with practical engineers and their problems. Only regular members or student members of the American Institute are eligible to membership in this branch. There is, however an Electrical Club, which includes all the members of the Institute and all other students in the electrical engineering course.

The Civil Engineering Society.—The students of the department of civil engineering organized the society for the purpose of promoting their interests in matters of practical importance to engineering students and alumni. Prominent engineers who have succeeded in special fields frequently meet with the members of the society to discuss the problems of their field. Meetings are held bi-monthly.

College Band.—The college band of forty-five members, under the instruction of Mr. Louis Howard, is one of the best amateur musical organizations in the state. The college provides instruments, music and instruction. The band is divided into two sections, beginners and experienced players. This gives a splendid opportunity for those who have never played and those who have some skill in the use of instruments.

Engineering Society.—The object is to aid its members financially by purchasing at wholesale rates, books, materials and instruments.

Agricultural Society.—All agricultural students are eligibile to membership in this society. Regular meetings are held for the discussion of topics of interest in scientific agriculture with special reference to the possibilities of farm life. A bookstore for the members has been conducted for several years.

Male Glee Club.—Men students who have the necessary range and quality of voice are admitted. Music and instruction is free. Rehearsals are held twice a week under the direction of the instructor of

vocal music. College and home songs as well as the works of the foremost American composers are studied.

Ladies' Glee Club.—This club consists of sixteen voices, otherwise it corresponds with the Male Glee Club. The same type of music is studied, and the rehearsals are held twice a week. Twice a year the clubs appear in joint concerts, performing the works studied, and forming also a mixed chorus. Separate public appearances are frequent.

Orchestra.—The M. S. C. Orchestra is an organization composed of students of the college. Last year its membership numbered twenty, but it is the aim of the director to have at least forty members for the year 1915-16, in order that they may work on some light symphony music.

Home Economics Club.—This club is composed of women students who are working for a degree in home economics. Meetings are held twice a month for the discussion of topics of interest to students in home economics and also to keep in touch with the work of the alumni of this department.

The Chemical Society.—The students taking the chemistry course join this society for the purpose of developing an interest in the professional side of the subject and also for studying topics that do not come up in regular class work. Regular meetings are held and abstracts of recent journal articles are presented.

College Union.—To provide recreation facilities, especially during the winter months, when outside games are not possible, the College Union has been formed. This organization includes all men students and faculty members in the institution, and has its headquarters in the College Union rooms on the fourth floor of Agricultural Hall. These rooms, which were fitted up during the summer of 1912, include two large game and recreation rooms and one reading room. In the game rooms, pool and billiard tables and the parlor games, such as chess and checkers, are provided. In the larger of these rooms, there is also a piano and good facilities for recreation and social intercourse on the part of the men students. In the reading room is placed an assortment of the popular magazines, as well as desks and all the necessary writing facilities. The general use of these rooms by the student body shows that they have met a very apparent want in the institution.

The Alumnae Club.—The active members of this organization are women graduates, residing in or near Bozeman; the associate members are the undergraduate women. The object of the club is to promote the interests of college women.

Social Clubs.—Greek letter fraternities are not permitted. Clubs which have for their object the improvement of the social life of their members are authorized. Two clubs of this kind are the Triangle A and the Kayenne. Each maintains a house in which its members

live. These clubs, like other student organizations, are under the supervision of the faculty.

CONTESTS.

Prize in Oratory.—An annual prize of twenty dollars is given to the winner of the annual local oratorical contest. This is open to all students. The winner represents the college in the state oratorical contest.

Armstrong Prize in Declamation.—Hon. F. K. Armstrong of Bozeman, gives a prize of ten dollars to the winner of the annual declamatory contest of the secondary schools. There is also a second prize of five dollars. Only regular students are eligible.

Extemporaneous Speaking.—Hon. Nelson Story, Jr., gives an annual prize of twenty-five dollars toward an Extemporaneous Speaking Contest. Fifteen dollars is given as first prize, and ten dollars as second prize. This contest is open to all regular students of the secondary schools.

SCHOLARSHIPS.

The State Board of Education has established a four-year scholarship in each of the accredited high schools for the student who receives the highest average grade in his class. These scholarships are awarded each year by the high school principals for their respective schools. This scholarship excuses the holder from paying any tuition or deposits. Any one winning a scholarship may choose any of the state institutions.

Federation Scholarship.—The State Board grants to the Montana Federation of Women's clubs a scholarship in each of the four state colleges each year. The Federation pays all college expenses of the woman elected, including board, room rent, books, athletic ticket and gymnasium suit.

ACCREDITED HIGH SCHOOLS.

Following is a list of the four-year accredited high schools of the state:

(1) **City High Schools.**—Anaconda, Belt, Billings, Butte, Belgrade, Chinook, Columbus, Conrad, Eureka, Forsyth, Glasgow, Great Falls, Hamilton, Havre, Helena, Harlowton, Laurel, Libby, Moore, Plains, Pony, Polson, Roundup, Stevensville, Sheridan, Terry, Thompson Falls, Three Forks, Victor, Virginia City, Valier, Whitehall, Whitefish, Wibaux.

(2) **County High Schools.**—Beaverhead, Dillon; Broadwater, Townsend; Choteau, Ft. Benton; Carbon, Red Lodge; Custer, Miles City; Dawson, Glendive; Fergus, Lewistown; Flathead, Kalispell; Gal-

latin, Bozeman; Granite, Philipsburg; Jefferson, Boulder; Missoula, Missoula; Park, Livingston; Powell, Deer Lodge; Sweet Grass, Big Timber; Teton, Choteau.

(3) **Parochial High Schools.**—Central High School, Butte; Mount Angela Ursuline Academy, Great Falls; Sacred Heart Academy, Missoula; St. Vincent's Academy, Helena.

(4) **Other Schools.**—Academy of the College of Montana, Deer Lodge; High School Department of the Butte Business College, Butte.

EMPLOYMENT FOR STUDENTS

A number of students earn a part of their expenses while in college. Students expecting to work their way should come with sufficient money to pay their expenses for one semester unless they have engaged work in advance. The college cannot guarantee employment, but those who are willing to give efficient faithful service have usually found work.

A few students are employed as janitors and as assistants in the shops, laboratories and barns. Others care for furnaces, horses and cows in the city, work in stores and at various kinds of house work. Calls for young lady students to work for their board are numerous.

Students readily find employment at profitable wages during the summer vacation. A large number annually get work with the transportation companies in the Yellowstone National Park as drivers, camp attendants and domestics. Engineering students are placed with the reclamation service, the railroads, and the electric power plants.

A faculty committee aids students to find employment. Those desiring work should write, stating experience and kind of work desired.

LIBRARY AND READING ROOM.

Public Depository.—By Act of Congress the library is now a depository and receives all public documents and other printed matter issued by the United States government.

Main Library.—The library occupies the south half of the first floor of Montana Hall. It contains 13,588 volumes, not counting public documents, and about 6,000 pamphlets. It is well supplied with standard works in technology, history, science and literature, as well as with dictionaries, cyclopedias and other reference works. About $1,500 is spent annually for books and periodicals.

Department Libraries.—The agricultural library occupies two rooms on the second floor of the Agricultural Hall. It contains almost complete bound sets for all state experiment station bulletins and United States Department of Agriculture publications, besides a large number of agricultural papers and standard works. One large room on the first floor of the biology building is used for the library and periodicals of the biological department. The library of the chemistry

department is located in the office of the chemist in the chemistry building. At the east end of the engineering laboratory is a large library and reading room for engineering students.

BASKET BALL TOURNAMENT AND SPEAKING CONTEST.

The annual high school basket ball tournament and speaking contest is held on Thursday, Friday and Saturday nearest the tenth of March. An invitation is extended to the sixteen high school basket ball teams, who have, through intra-district competition, proven their superiority. Significant school trophies are presented to the best teams, and suitable individual awards are given to the team members. In connection with the tournament an extemporaneous speaking contest is held.

ORGANIZATION OF INSTRUCTION.

A. The following four-year college courses, each leading to the degree of Bachelor of Science, are offered:

1—College of Agriculture.

(1) Agronomy; (2) Animal Industry; (3), Horticulture; (4) Dairy.

2—College of Engineering—

(1) Civil Engineering; (2) Electrical Engineering; (3) Mechanical Engineering; (4) Chemical Engineering; (5) Architectural Engineering; (6) Irrigation Engineering.

3—College of Applied Science—

(1) Botany and Bacteriology; (2) Entomology; (3) Chemistry; (4) Industrial Chemistry.

4—College of Industrial Arts—

(1) Home Economics; (2) Applied Art; (3) Secretarial Work.

B. The following courses, not leading to a bachelor's degree are offered:

1—School of Home Economics.

2—School of Mechanic Arts.

3—School of Agriculture.

4—Art School.

5—Secretarial Work.

6—Music School.

NOTATION.

In the following tables and descriptions of courses the signs used are as follows: All numbers given in the parentheses are the numbers of the courses and the description of the work may be found by these numbers. So the notation (Math. 3) means that the course referred to is the course in mathematics numbered 3, which is analytical geometry and calculus. The letters of the alphabet without numbers are used in parentheses in the same way to indicate courses of sub-freshman rank. The arabic numbers used without parentheses in the tables and in the description of the courses indicate the number of credits toward graduation allowed for the subject. In the description of the courses the Roman numerals, I. and II. are used to designate the first and second semesters. M., T., W., Th., F., and S. are used to indicate the working days of the week, and the numerals "10 to 11" or "3 to 4" to indicate the morning or afternoon hours. In the case of elective subjects, no hours are given The time of the recitations for elective subjects will be announced as the work is called for.

College of Agriculture

This College consists of three departments, viz, Agronomy, Animal Industry and Horticulture. For the first two years the work is the same in all three courses. At the beginning of the junior year the student chooses the group in which he desires to specialize. The aim of this work is to give a thoroughly practical course based on a broad, scientific foundation, along the lines of field agriculture, horticulture, livestock, dairying and poultry.

The college is very completely equipped for agricultural instruction. A large agricultural building, thus centralizing the work, a one thousand-acre farm, a large orchard and garden, large and well equipped laboratories for the study of soils and crops, for milk testing and dairy manufacturing and for the study of farm machinery, a large greenhouse well stocked with plants, and several barns and other buildings filled with various breeds of livestock including beef and dairy cattle, horses, sheep, hogs and poultry—all these are at the command of the agricultural student.

AGRICULTURE.

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)..	2	English Composition (Eng. 1).	2
Public Speaking (Eng. 4)....	1	Public Speaking (Eng. 4)....	1
General Chemistry (Chem. 1)..	4	General Chemistry (Chem. 1).	4
General Botany (Biol. 9)	5	Gen. Des. Physics (Phys. 1a)..	5
Trig. and Log. (Math. 2a)....)			
—or—)	3	Prin. Plant Production (Hort. 1)	3
Applied Algebra (Math. 7)...)			
Farm Dairying (Dairy 21)....	3	Animal Types (An. Ind. 1)....	3
Drill or Physical Education...	1	Drill or Physical Education..	1
	19		19

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2	Expository Composition (Eng. 2)	2
Organic Chemistry (Chem. 5)..	5	Agricultural Chemistry (Chem. 7)	5
Field Crops (Agron. 1).....	4	Forage Crops (Agron. 11).....	4
Fruit Growing and Gardening (Hort. 10)	4	Vet. Anatomy and Physiology (Vet. Sci. 51))	
Invertebrate Zoology (Biol. 1)..	3	—or—)	4
Drill or Physical Education ...	1	Entomology (Biol. 4))	
		Geology (Geol. 1)	3
		Drill or Physical Education...	1
	19		19

Course in Agronomy

Agronomy is the science of the field and its crops. It treats of the production and improvement of field crops, the cultivation of soils and the maintenance of their fertility, and general farm management, which is the application of economic business methods to farm practices.

Because of the peculiar agricultural conditions existing in western states, a new agriculture is being developed. The handling of dry farming lands is necessary only in the West. The problems which have to do with irrigation water, and the cultivation of the soil and management of the crops under irrigation must be solved by the western investigators and agriculturists. It is to fit men to deal with these and other questions of production of the farm that this course is offered.

The first two years of the agronomy course are devoted to the study of the natural sciences, languages and some general agricultural work. This places the student in a position to appreciate and intelligently discuss the methods of practice taken up later in the course.

The last two years of the course are designed to give the student clear insight into methods for the cultivation and maintenance of the fertility of the soil; the peculiarities of the growth and handling of different crops; the arrangement, the laying out of the farm, and the principles which govern successful farm management.

With a constantly growing appreciation of the value of the agricultural lands of the West, comes an active demand for young men trained along the lines of practical and scientific agronomy, men who combine college training with practical experience and native ability. Such training is offered to young men in this course. The demand for such students is unlimited, at a compensation not exceeded in any other calling. A few of the many lines open to graduates of this department are: College and experiment station work, agricultural journalism, management of large irrigated and dry farms, management and salesmanship for seed firms, and superintendencies for companies with large land holdings.

With the completion and settlement of Federal irrigation projects, there has come a demand for trained men to assist settlers who may be unacquainted with crop raising under irrigation. The field is an attractive one, both from the point of remuneration, and from the possibility of useful service.

AGRONOMY.

JUNIOR YEAR

First Semester		Second Semester	
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Soil Physics (Agron. 2)	5	Soil Fertility (Agron. 3)	3
Bacteriology (Biol. 12)	5	Plant Physiology (Biol. 10)	4
Breeds of Livestock (An. Ind. 2)	4	Organic Evolution (Biol. 14)	3
Elective	3	Elective	7
	19		19

SENIOR YEAR.

Farm Management (Agron 6)	4	Soil Management (Agron. 8)	2
Prin. of Breeding (Agron. 7)	4	Adv. Grain Judging (Agron. 5)	2
Plane Surveying (C. E. 1a)	3	Common Diseases (Vet. Sci. 57)	4
Farm Records and Accounts (Agron. 10)	2	Plant Pathology (Biol. 11)	4
Elective	6	Farm Mechanics (Agron. 4)	3
	19	Elective	4
			19

Course in Horticulture

The four years' course in horticulture, leading to the degree of Bachelor of Science in horticulture, is designed to prepare students as teachers in agricultural colleges, investigtors in the agricultural experiment stations, editors of horticultural papers, managers of fruit associations and superintendents of commercial orchards and fruit plantations. The Western United States leads the world in methods of orcharding and disposing of orchard products, and there is a strong and growing demand for persons properly trained to manage the orchard project now operated throughout the fruit regions of the west. Fruit growing, when done in a scientific way, is extremely profitable and presents an inviting field for the trained horticulturist. The college offers good facilities for a thorough training in all branches of horticulture.

HORTICULTURE.

JUNIOR YEAR

First Semester		Second Semester	
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Soil Physics (Agron. 2)	5	Soil Fertility (Agron. 3)	3
Bacteriology (Biol. 12)	5	Plant Physiology (Biol. 10)	4
Systematic Pomology (Hort. 4)	3	Organic Evolution (Biol. 14)	3
Elective	4	Commercial Veg. Gardening (Hort. 11)	3
		Elective	4
	19		19

SENIOR YEAR.

Commercial Fruit Growing (Hort. 7)	3	Landscape Gardening (Hort. 6)	3
Plane Surveying (C. E. 1a)	3	Greenhouse Const. and Mgmt. (Hort. 5)	3
Prin. of Breeding (Agron. 7)	4	Plant Pathology (Biol. 11)	4
Elective	8	Elective	8
	18		18

Courses in Animal Industry

The work in animal industry embraces the selection, breeding, judging, feeding and caring of farm animals.

This course covers four years, with a view toward a scientific preparation for Agricultural College and Experiment Station work, instruction on animal industry in high schools, county expert lines, positions as buyers and salesmen of livestock, and managers of stock farms.

The first two years of this course are devoted to the study of language and the sciences, with a few agricultural subjects as a preparation for the work which is to follow. The last two years aim to give practical application to the special phases of the livestock industry.

This course is given through text books, lectures, practice and observation. The aim is to acquaint the student with modern ideas and methods of the most successful breeders and stockmen, both in this country and abroad. The stock judging includes ring judging and excursions to nearby farms in the vicinity of the College, livestock exhibitions and fairs. Practical instruction is also given in compounding rations, making out pedigrees, breeding records and general care of livestock.

ANIMAL INDUSTRY.

JUNIOR YEAR

First Semester		Second Semester	
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Breeds of Livestock (An. Ind. 2)	4	Animal Nutrition (Chem. 11)	3
Bacteriology (Biol. 12)	5	Common Diseases of Farm Animals (Vet. Sci. 57)	4
Soils (Agron. 2)	5	Organic Evolution (Biol. 14)	3
Poultry Management (An. Ind. 41)	3	Optional	6
		Animal Industry	
		Market Classes and Grades of Livestock (An. Ind. 5)	2
		Elective	4
		Poultry	
		Poultry Breeds (An. Ind. 42)	3
		Incubation & Brood (An. Ind. 43)	3
	19		18

SENIOR YEAR.

Feeding Farm Animals (An. Ind. 4)	3	Farm Mechanics (Agron. 4)	3
Prin. of Breeding (Agron. 7)	4	Optional	16
Embryology (Biol. 13)	4	Animal Industry	
Farm Management (Agron. 6)	4	Obstetrics (Vet. Sci. 54)	3
Optional[1]	4	Breed. Farm Animals (An. Ind. 6)	2
Animal Industry		Soil Fertility (Agron. 3)	4
Adv. Stock Judging (An. Ind. 3)	1	Horse and Beef Prod. (An. Ind. 8)	3
Swine and Sheep Prod. (An. Ind. 7)	3	Elective	4
Poultry		Poultry	
Poultry Feeds and Feeding (An. Ind. 45)	2	Poultry Houses (An. Ind. 44)	3
Elective	2	Market Poultry Prod. (An. Ind. 46)	3
		Adv. Poultry Breeds (An. Ind. 47)	3
		Elective	7
	19		19

Course in Dairy Husbandry

The course in dairy husbandry embraces both the productive and the manufacturing features of the dairy industry. The first two years are given largely to a study of the general and the agricultural sciences with a view toward preparing the student for economic application of practical dairy problems.

The productive phase of the work includes the management of the dairy herd, handling of milk on the farm, transportation, distribution, inspection and marketing of milk. The manufacturing phase deals with the more technical work in separation, testing and preparation of dairy products, factory management, exhibiting, judging and marketing.

This course is designed to fit the student for the rapidly growing demand for men trained in practical, modern dairy science. The positions open are financially attractive, and offer splendid opportunities for rapid advancement, especially as pertains to college experiment station and educational lines. Of no less importance is the commercial side as it pertains to milk production, farm, factory and corporation management; farm, factory and municipal inspection; dairy manufacturers and marketing.

DAIRY HUSBANDRY.

JUNIOR YEAR

First Semester		Second Semester	
Economics (Econ. 2)	2	Economics (Econ. 3)	2
Breeds of Livestock (An. Ind. 2)	4	Market Classes and Grades of Livestock (An. Ind. 5)	2
Bacteriology (Biol. 12)	5	Animal Nutrition (Chem. 11)	3
Milk Production (Dairy 27)	3	Butter Making (Dairy 23)	4
Testing Milk Products (Dairy 22)	2	Dairy Technology (Dairy 30)	3
Elective	2 or 3	Elective	4 or 5
	18 or 19		18 or 19

SENIOR YEAR.

Soil Physics (Agron. 2)	5	Sociology (Econ. 4)	3
Farm Management (Agron. 6)	4	Obstetrics (Vet. Sci. 54)	3
Cheese Making (Dairy 24)	4	Dairy Practice (Dairy 26)	3
Market Milk (Dairy 25)	2	Dairy and Market Management (Dairy 28)	2
Seminar (Dairy 29)	1	Seminar (Dairy 29)	1
Elective	2 or 3	Elective	6 or 7
	18 or 19		18 or 19

AGRONOMY.

Professor Atkinson
Assistant Professor Whitcomb
Assistant Professor Currier.

The facilities for agronomy instruction include ample class room accommodations and fully equipped laboratories for crop, soil and farm management study.

The field crops laboratory is modern in every particular, with vermin-proof storage cases for grain, sheaf and forage samples, and with a large amount of specimen material preserved as mounts under celluloid. These mounted type specimens of the various field crop plants are used in class, and ample sheaf and threshed grain and fodder material is furnished for careful study. Score cards suited to Montana conditions are used.

For the forage classes, large quantities of field specimens of the different clovers, grasses and fodders of various sorts are collected each summer, and leaf, stem and root studies are made on these in class.

The soil laboratory accommodations are ample, and a large amount of modern apparatus is put at the disposal of students for careful work in soil physics.

For farm management instruction, the farm survey data accumulated by the Experiment Station and Extension Service, is abailable. This consists of the records of a large number of farms conducted under different systems of management.

(1) **Field Crops.** This course takes up a careful study of the grain crops suited to growth in Montana. The history, characteristics and management of wheat, oats, barley, corn, flax and other cereals are carefully studied. Students become familiar with commercial grain standards and with the use of the score card in grain judging. Prerequisite: Biology (9); Lectures, 2; laboratory, 2; I., 4.

(2) **Soil Physics.** This course is designed to prepare the student to understand better the effects of the different methods of treating soils, and the influence of these upon moisture, texture, aerations, fertility and production. It comprises a review of the origin, formation and classification of soils and study of the conditions influencing the supply of heat, air and moisture as related to growing plants. The work of the class room is supplemented by laboratory work comprising the determination of such questions as the water-holding capacity and capillary power of various soils, and the effect of mulches and of various systems of rotation on the physical condition of the soil. Prerequisite: Physics (1a); geology (1); chemistry (5). Lectures, 3; laboratory, 2. I., 5.

(3) **Soil Fertility.** Maintenance of fertility, fertilizers and rota-

tion. The influence of barnyard manure, green manuring and commercial fertilizers upon the quality and yield of the soil and upon succeeding crops, different rotations and the ultimate effect of different methods of farm management upon the fertility and productive capacity of the soil, and also a study of the preservation of barnyard manure. Prerequisites: Chemistry (7), biology (12). II., 3.

(4) **Farm Mechanics** includes the study of the development, construction, functions and methods of operating, adjusting and repairing implements and farm machinery; also a study of the principles of draft and the production of power, and the care and operation of such farm power machinery as the wind-mill, gasoline engine, and the different makes of traction plowing machinery. Prequisites: Physics (1a), agronomy (1 and 2). Lectures, 2; laboratory, 1. II., 3.

(5) **Advanced Grain Judging.** In this course is given constant practice in judging cereal, grass and forage seeds. Prerequisites: Agronomy (1). Laboratory, 2. II., 2.

(6) **Farm Management.** This course considers the problems of farm management. The relative profits of different systems of farm management, the relation of the industry of agriculture to other industries, and the social conditions of agriculture are considered. Prerequisites; Agronomy (1 and 2). I., 4.

(7) **Principles of Breeding.** This course considers the different theories of plant and animal improvement ,and embraces a study of selection, heredity, variation, atavism and fecundity; also cross breeding and in-breeding with a historical study of their results. Prerequisite: Biology (14). Lectures, 4. I., 4.

(8) **Soil Management.** This course includes a study of the most approved methods of handling various soils in their relation to crop production. It embraces a study of alkali, sandy, heavy clay, gumbo, muck, peat and old worn-out soils, as well as a study of the management of irrigated and dry farm lands. Prerequisites: Agronomy (1 and 2). II., 2.

(9) **Thesis.** During the senior year, agronomy students will be allowed four credits if they prepare an acceptable thesis on some subject to be approved by the head of the agronomy department. The subject of this thesis must be decided upon no later than November 15, of the senior year, and must include a literature review and some experimental work along the line of the subject chosen. I. and II, 4.

(10) **Farm Records and Accounts.** A course designed to thoroughly familiarize the student with different methods of keeping farm records and accounts, and to point out systems that have given best results when employed by farmers in Montana and other states.

Some of the topics to be considered are as follows:

1. Labor records.
2. Labor distribution charts.
3. Feeding records.
4. Accounts with single enterprises.

5. Complete cost accounts.
6. Individual performance records.

Lecture, 1; laboratory, 1; I., 2.

(11) **Forage Crops.** A study of grasses, clovers and other crops when the entire plant is cut for hay or used for silage, pasturage or soiling. The history and characteristics of the different forage crops; the management of the heavy yielding kinds under irrigation; and the production of forage on non-irrigated land, will be studied. Prerequisite: Agronomy (1). Lectures, 3; laboratory, 1; II., 4.

ANIMAL INDUSTRY.

Professor————
Professor Welch.
Professor Schoppe.
Assistant Professor Martin.
Assistant Professor Riley.
Mr. Tretsven.

This department of the college maintains a large number of specimens of the leading breeds of livestock, which are available for instructional purposes. Among these breeds are: Percheron horses, Hereford, Short-horn, Angus, Jersey and Guernsey cattle; Berkshire, Poland-China, Duroc and Yorkshire swine; Cotswold, Shropshire and Rambouillet sheep, together with several leading breeds of poultry.

The livestock used in the experimental work of the station are also available for study and offer many practical demonstrations in feeding and management for students in this department.

The animals are housed in a number of comfortable stables of modern plan and construction, which furnish the students a knowledge of well arranged and equipped farm buildings.

ANIMAL HUSBANDRY.

Professor————
Assistant Professor Riley.
Mr. Tretsven

(1) **Animal Types.** A study of types as related to production and work. This course covers the judging of the different market classes of cattle (beef and dairy), of sheep (mutton and wool), of horses (light and heavy), and of hogs (bacon and fat). The entire time of this course is given to practical handling and judging of the stock in the stock pavilion. Laboratory, 3. II., 3.

(2) **Breeds of Livestock.** A study of the history, development and characteristics of the leading breeds of livestock, including pedi-

grees and performances of superior individuals among horses, cattle, sheep and swine. Lectures, 4; laboratory, 1. I., 5.

(3) **Advanced Stock Judging.** Judging horses, cattle, sheep and swine with particular reference to breed, character and differences. Practical methods of show yard judging; relation of purebred stock to market classes. Prerequisites: An. Ind. (1 and 2). Laboratory, 1. I., 1.

(4) **Principles of Feeding.** The principles underlying the profitable feeding of farm animals. The composition of plants, animals and animal products. The practice that gives best results as indicated by available data gathered from the work of experiment stations in this and other countries. I., 3.

(5) **Market Classes and Grades of Livestock.** Includes the judging of the different market classes and grades of livestock. Market classification. Lecture, 1; laboratory, 1. II., 2.

(6) **Breeding of Farm Animals.** A study of the principles and approved methods relating to the breeding of livestock. Prerequisites: An. Ind. (1); Agron. (7). Lectures, 2. II., 2.

(7) **Swine and Sheep Production.** A study of practical methods of pork production, including grazing problems, feeding, rearing and marketing. Feeding, care and management of the breeding herd. A study of the feeding, care and management of the breeding flock, rearing for mutton and wool, range problems, and a study of systems of sheep farming. Lectures, 3. I., 3.

(8) **Horse and Beef Production.** A study of the care and management of breeding and growing horses, fitting for show, market classes and their production.

A study of practical methods of beef production, including feeding, care and management of beef cattle herds; fitting for show, feeding for market, and pasture problems. Lectures, 3. II., 3.

(9) **Experimental Feeding.** A study of methods in experimental feeding, and original investigations in feeding horses, cattle, sheep and swine.

Elective: Lectures, 1; laboratory, 1. II., 2.

(10) **Meats.** Farm butchering, curing and care of meats, yield, quality and values of meat and by-products, as related to breeding, feeding and health of animals. Classes, grades and cuts of meat in markets. Prerequisite: An. Ind., (1). Lectures, 1; laboratory, 1. II., 2.

DAIRY HUSBANDRY.

Assistant Professor Martin.

The college dairy occupies several rooms on the first floor of Agricultural Hall, consisting of a class room, refrigerator room, cheese room, creamery and testing laboratory.

The creamery is equipped with two combined pasteurizers, and cream ripeners of the Jensen and Wizard types; a starter can, com-

bined churn and worker; a continuous disc ice-cream freezer; butter printers, Bohn refrigerator for storage of dairy products and other minor equipment. In addition, is a five-horse power steam boiler, and a five-horse power electric motor, which furnish power for the operation of the machinery.

The cheese room is equipped with several steam jacketed cheese vats, an upright and horizontal cheese press, paraffin tank and other necessary equipment for the making of the common types of cheeses.

The testing laboratory is well equipped with lockers, sufficient to accommodate thirty students and is provided with steam and hand power Babcock testers, moisture ovens, scales and the glassware and other equipment necessary in analyzing and testing of all kinds of dairy products.

(21) **Farm Dairying.** The course embraces a study of dairying in its general relation to the farm; selection of the cow, the dairy sire, management of the calf, building up the herd, and feeding for milk production. In addition, laboratory practice in the use of the Babcock test; operation of hand separators; ripening cream and making butter on the farm. Lectures, 2; laboratory, 1. I., 3.

(22) **Testing Milk Products.** A study of the composition of milk and its products in relation to the manufacturing processes; practical methods of determining ingredients and tests for adulterate and preservatives. Prerequisites: An. Ind. (21); Chem. (2). Lecture, 1; laboratory, 1. I., 2.

(23) **Creamery Butter Making.** This course embraces the handling of cream and making butter on a commercial scale. The laboratory practice will include pasteurizing cream; making of starters; ripening cream, churning, packing and storage of butter. Prerequisites: An. Ind. (21) and (22). Lectures, 2; laboratory, 2. II., 4.

(24) **Cheese Making.** This includes a study of the principles involved in modern methods of making the common types of cheeses, as applied to factory and farm practice. Lectures, 2; laboratory, 2; I., 4.

(25) **Market Milk.** This course includes the production and control of the milk supply, pasteurizing, standardizing, certifying, modifying and city milk inspection. Lectures, 2; I., 2.

(26) **Dairy Practice.** This course includes laboratory practice in making butter, cheese and frozen dairy products, preparation of exhibits, scoring, marketing and keeping dairy accounts. Prerequisites: An. Ind. (23) and (24). Lecture, 1; laboratory, 2; II., 3.

(27) **Milk Production.** A study of the factors influencing secretion, composition and properties of milk; care and handling of milk on the farm and in transit; distribution and marketing. Prerequisite: An. Ind. (21); Lectures, 2; laboratory, 1; I., 3.

(28) **Dairy and Market Management.** This is a study of the organization and management of dairy farms, herd improvement associations, organization, location, construction and equipping of creameries

and cheese factories; cold storage and marketing of dairy products and creamery sidelines. Lectures, 1; laboratory, 1. II., 2.

(29) **Seminar.** A study and discussion of current dairy problems and investigations by experiment stations and comparative studies of practical dairying in other countries. I. and II., 2.

(30) **Dairy Technology.** This course includes a study of the composition, manufacture and utilization of dairy products and by-products as applied in domestic and commercial arts. Lectures, 2; laboratory, 1. II., 3.

HORTICULTURE.

Professor Whipple.
Mr. Starring.

The department of horticulture is well provided with laboratory equipment. In the greenhouse, there is a large collection of plants carefully selected for the purpose of furnishing material and illustrations for work in plant propagation, greenhouse management and home floriculture. There is also ample space for laboratory work in vegetable gardening. The greenhouses themselves are splendid examples of greenhouse construction. An orchard and small fruit garden are maintained for laboratory and demonstration purposes. The campus which is well laid out and planted with a large collection of ornamental trees and shrubs may be considered a well equipped laboratory for landscape gardening work and in the city of Bozeman there are many beautiful homes which well illustrate the principles of landscape planting.

(1) **Principles of Plant Production.** A course designed for all students in agriculture and others interested in the subject of plant production. The time is given largely to the study of the principles and practice of plant propagation, including practical work on the propagation of plants by spores, seeds, cuttings, layers, graftage and other methods of lesser importance; methods of gathering and storing seeds and their influence upon germination; transplanting, principles, methods and influence upon the growth of plants. Prerequisite: Biology (9). Lectures, 2; laboratory, 1. II., 3.

(4) **Systematic Pomology.** This course takes up the systematic side of pomology, the description and naming of varieties of fruit. Considerable time will also be devoted to the judging of exhibition fruit and discussion of score cards. The latter part of the course will be devoted to a study of the evolution of cultivated plants, especially fruits. Prerequisites: Hort. (1); Biol. (9). Lectures, 2; laboratory, 1. I,. 3.

(5) **Greenhouse Construction and Management.** The construction, heating and maintaining of greenhouses, with lectures and practice

treating of the methods of growing plants in greenhouses and conservatories. Prerequisites: Hort. (1), Agron. (2) and (3). I., 3.

(6) **Landscape Gardening.** The laying out and planting of private and public grounds are discussed. The trees, shrubs and flowers suited to Montana conditions are studied. Lectures, 2; laboratory, 1. II., 3.

(7) **Commercial Fruit Growing.** In this course the methods of planting, cultivating, irrigating and managing commercial orchards are discussed in the class room and orchard. The methods of picking, grading, packing and marketing fruits are important phases of the course. Prerequisites: Hort. (1), and (4); Agron. (2) and (3). Lectures, 2; laboratory, 1. I., 3.

(8) **Thesis.** Horticultural students may elect to prepare during the senior year a thesis, the subject of which must be approved by the head of the department of horticulture. The number of credits to be allowed for such work will be determined by the head of the horticultural department and the instructor under whom the work is selected.

(9) **Home Floriculture.** An elective course open to senior and junior girls only. A brief study of the simple principles of plant propagation by seedage, cuttage and layerage, selection, identification, and general care of house plants. Window gardening, window boxes, hanging baskets and porch decorations in general. The use and care of flowers on the lawn, the simple principles of dooryard planting, and suggestions on ornamental plants. Lectures, 2. II., 2.

(10) **Fruit Growing and Gardening.** A course dealing with the principles of orcharding and gardening, with particular reference to their bearing upon home orcharding and home gardening. The course is designed to give all agricultural students a working knowledge in these lines of horticultural work and an outlook as to the possibilities in these industries within our state. Prerequisite: Hort. (1). Lectures, 4. I., 4.

(11) **Commercial Vegetable Growing.** In this course the commercial aspects of gardening, the organization and management of market and truck gardens and special problems connected with growing vegetables on a large scale will be considered. The economics of growing important vegetable crops such as cabbage, cauliflower, celery, onions, potatoes, etc., will be studied. Special attention will be paid to the preparation of vegetables for market and methods of marketing. The various types of markets and their requirements will be studied. The storage of vegetables will be taken up. This course will be treated with lectures and laboratory work. Prerequisites : Hort. (1) and (10). Agron. (2). Lectures, 2; laboratory, 1. II., 3.

POULTRY HUSBANDRY.

Professor Schoppe.

(41) **Poultry Management.** A general course which shall comprise a study of the types and breeds of poultry. The fancy and utility classification of fowls, principles of breeding, housing, feeding, incubation and brooding. The preparation for and marketing of poultry products. Lectures, 3; I., 3.

(42) **Poultry Breeds.** Lecture course dealing with the origin and development of the more important breeds of poultry. Breeding fancy poultry. Preparation of birds for show. Judging by score card and comparison. Lectures, 2; laboratory, 1; II., 3.

(43) **Incubation and Brooding.** Lecture course on the principles and practice of operating incubators and brooders. Practice in operating incubators, testing eggs, keeping records, etc., also practice in operating brooders, care and feeding of chicks. The laboratory course will have no scheduled hours, but the time will be devoted to actual practice in operating incubators and brooders, each student having to bring off at least one hatch of chicks and satisfactorily brood them. Lectures, 2; laboratory, 1; II., 3.

(44) **Poultry Houses.** A study of the principles of poultry house construction; planning, arranging, and designing poultry houses. Lectures, 3. II., 3.

(45) **Poultry Feeds and Feeding.** Lectures taking up the principles of feeding poultry. Feeds suited to poultry, grain mixture, etc., feeding for egg production and fattening stock for market. Student will be required to feed a pen of birds and keep accurate records of feed consumed, labor, etc. Lectures, 2; I., 2.

(46) **Marketing Poultry Products.** Lecture on the preparation of poultry and eggs for market, storage preservation and the principles of marketing, killing, picking and packing poultry. Drawing, boning, and trussing fowls for special market. Candling, grading and packing eggs. Lectures, 2; laboratory, 1; II., 3.

(47) **Advanced Poultry Breeding.** Lecture course, in which the more advanced principles involved in breeding birds for show purposes will be considered. A study will also be made of the work which has been done by the various experiment stations in breeding for egg production. The laboratory work will include practice in judging birds, selection and mating of birds for fancy and utility purposes. Prerequisites: Agron. (7); An. Ind. (42); Lectures, 2; laboratory, 1; II., 3.

VETERINARY SCIENCE.

Dr. Welch

(51) **Veterinary Physiology and Anatomy.** A course in the physiology of domestic animals, dealing with digestion and assimilation of foods, the circulation and functions of the blood, the nervous system and organs of special sense, and muscles and phenomena of locomotion. Each of these topics will be accompanied by laboratory work, showing the anatomical features of each system by means of models, charts and actual dissection. Text book: A Manual of Veterinary Physiology, F. Smith. Lectures, 3; laboratory, 1. II., 4.

(53) **Pathology.** This course is designed to make the student familiar with normal and pathological tissues. Gross and microscopical specimens will be used for demonstration. Prerequisite: Vet. Sci. (51). Lecture, 1; laboratory, 2. II., 3.

(54) **Obstetrics.** Diseases of domestic animals incident to reproduction. Normal parturition, dystokia, and care of the newborn, are especially emphasized, and illustrated by clinic cases. Prerequisite: Vet. Sci. (51). II., 3.

(56). **Sanitary Science.** Relating to the care and handling of animals affected with communicable diseases. Farm sanitation, quarantine, and general preventive measures. Prerequisite: Vet. Sci. (57); II., 2.

(57) **Common Diseases of Animals.** A course on the diagnosis, treatment and prevention of the diseases of domestic animals. Students will be required to visit cases illustrative of these diseases, and to familiarize themselves with methods of diagnosis and first-aid treatment. Prerequisite: Vet. Sci. (51). II., 4.

College of Engineering

The rapid development of the State of Montana makes the profession of engineering one of great importance. The development of our natural resources will require the services of engineers with specialized training.

As a result of the action of the State Board of Education, made necessary by the passage of the Leighton Bill, all engineering courses supported by the state, except the course in mining engineering at the School of Mines at Butte, have been concentrated in the State College at Bozeman. As a result of this concentration of effort, important additions and improvements have been made, very important additional laboratory space has been provided and extensive and important additions have been made to the equipment largely without cost to the state.

COURSES AND DEGREES.

The following engineering courses are offered in the College: Civil Engineering, Electrical Engineering, Mechanical Engineering, Chemical Engineering, Architectural Engineering, and Irrigation Engineering.

The degree of Bachelor of Science is conferred upon students completing the work prescribed in any one of the college courses and the name of the course taken is placed on the diploma.

A candidate for the advanced degree of Civil Engineer, of Electrical Engineer, of Mechanical Engineer, of Chemical Engineer, of Architectural Engineer or of Irrigation Engineer, must hold a bachelor's degree from this college or another of at least equal rank, and in the line of work for which he applies for advanced degree, he shall have sufficient preparation in his major subject to enable him to carry on independent investigations. He shall complete a full year of resident study.

There shall be one major subject and one or two minor subjects. At least one-half of the work must be done in the major subject. The plan of the work must be approved by the Faculty Committee on Graduate Work by October 1. The candidate shall also present a thesis embodying the results of independent investigation, which may be a part of the credits required for the major subject. He shall also pass an oral examination on his graduate work before a committee of not less than five members representing the departments offering his major and minor subjects and two or more allied departments. Non-resident graduates in engineering must have at least three years of successful professional experience.

Civil Engineering

This course is designed to give a broad education in the general and scientific subjects which are the foundation of all branches of technology, and special training in those subjects comprised under the term "Civil Engineering." The young men are taught how to think, and how to attack new problems; they are taught the underlying principles of engineering and inspired with a desire to do their best work. The graduate is prepared to enter upon the location and construction work of railroads, public highways, bridges, water works, water power development, irrigation, sewerage systems and sewage disposal, city and municipal engineering. He can with advantage take up allied work in mining, mechanical, electrical or architectural engineering.

The freshman year is devoted to fundamental studies which give both general culture and preparation for the technical work of the following years.

In the sophomore year the fundamental subjects of mathematics, English, physics and chemistry are completed, and the technical subjects of civil engineering are begun. The theory of land surveying is taught by lectures, field work, and drawing room exercises. The study of the theory and principles of highway and railroad engineering is begun.

The junior year completes the work in theoretical and applied mechanics and railroad engineering. The technical subjects of hydraulic engineering, structures and bridges, theory and design, are begun. The course in economics begun in the first term of the junior year is continued for three semesters, and consists of the study of such subjects as land, capital, labor, coinage, banking, interest, wages, taxation, etc. The important economic questions of the present time are considered and discussed.

The senior year is devoted to municipal and sanitary engineering, plain and reinforced concrete construction, the design of typical bridges and buildings, with complete working drawing, bill of materials and estimate of cost.

The student who completes this course receives the degree of Bachelor of Science in Civil Engineering. Mature young men desiring to take special studies without being candidates for the degree, will be afforded every facility in so doing.

Undergraduates wishing to specialize in any special branch of civil engineering may do so by obtaining the approval of the faculty for the course desired.

*Feshman Civil Engineering students are required to take the Sophomore Summer School in Railroad Surveying, at the end of the second semester. They will act as chainmen, rodmen, etc.—Two credits.

*Summer School course in Railroad Surveying required of all sophomores at the end of the sophomore year. Two weeks in camp. —Two credits.

CIVIL ENGINEERING.

FRESHMAN YEAR.

First Semester		Second Semester	
English Comp. (Eng. 1)	2	English Comp. (Eng. 1)	2
Public Speaking (Eng. 4)	1	Public Speaking (Eng. 4)	1
Algebra (Math. 1)	3	Anal. Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chem. (Chem. 1)	4	General Chem. (Chem. 1)	4
Elem. Drawing (M. E. 1)	3	*Land Surveying (C. E. 1)	2
Wood Work (M. E. 2)	2	Military Drill or Physical Education	1
Forge Work (M. E. 6)	1		
Military or Physical Education	1		
	19		19

SOPHOMORE YEAR.

Expository Comp. (Eng. 2)	2	Calculus (Math. 4)	4
Calculus (Math. 4)	5	General Physics (Phys. 1)	3
General Physics (Phys. 1)	3	Physical Meas. (Phys. 2)	2
Physical Meas. (Phys. 2)	2	Tech. Mechanics (C. E. 5)	4
Plane Surveying (C. E. 2)	3	Geology (Geol. 1)	3
Minerology (Geol. 2) —or— Engr. Chemistry (Chem. 12)	3	*R. R. Engineering (C. E. 4)	2
Military or Physical Education	1	Military Drill or Physical Education	1
	19		19

JUNIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mech. of Materials (C. E. 6)	4	Hydraulics (I. E. 4)	3
Highway Engr. (C. E. 7)	2	Roofs and Bridges (C. E. 29)	3
Irrigation Eng. (I. E. 1)	3	Hydraulic Lab. (I. E. 6)	1
Str. of Mtrl. Lab. (C. E. 8)	1	Astronomy (Math. 6)	4
Graphics (C. E. 28)	2	Pbl. Water Supply (C. E. 15)	2
R. R. Economics (C. E. 9)	3	Hydraulic Engr. (I. E. 5)	3
Steam Engr. (M. E. 7)	2	Mech. Laboratory (M. E. 15a)	1
	19		19

SENIOR YEAR.

Economics (Econ. 5)	3	Sanitary Engr. (C. E. 14)	3
Bridge Design (C. E. 30)	4	Bridges and Dams (C. E. 31)	2
Municipal Engr. (C. E. 3)	2	Concrete Const. (C. E. 32)	3
Found. and Masonry (C. E. 21)	3	Cem. & Concr. Lab (C. E. 34)	1
Geodesy (C. E. 17)	2	Contract & Spec. (C. E. 23)	1
San. Bacteriology (Biol. 12)	2	Stl. Mill Bldgs (A. E. 11)	2
Elect. Machinery (E. E. 1)	2	Seminar (C. E. 12)	1
Elect. Laboratory (E. E. 14a)	1	Thesis (C. E. 27)	4
		Elective	2
	19		19

Electrical Engineering

This course provides a thorough technical training in electrical engineering. The rapid development of electrical engineering is largely due to the use of sound theory in the solution of commercial problems. For this reason the theoretical subjects, and the application of theory to the solution of practical problems are emphasized.

The course is designed to teach students the scientific laws and principles forming the basis of the profession, and the application of these laws and principles to commercial problems. The general training consists of courses in mathematics, physics, chemistry, drawing, and shop work. The electro-technical work consists of lectures and recitations on the theory of electrical phenomena, and on problems in the design, construction and operation of electrical machines and apparatus. Conventional methods are used in drawing and designing, and the experimental tests made in the laboratory are essentially similar to the tests made by large manufacturing companies. The apparatus and instruments used are of modern commercial types.

The course is supplemented by an annual inspection trip to some of the large power plants of Montana, and by lectures by prominent electrical engineers.

ELECTRICAL ENGINEERING.

FRESHMAN YEAR.

First Semester		Second Semester	
English Comp. (Eng. 1)	2	English Comp (Eng. 1)	2
Public Speaking (Eng. 4)	1	Public Speaking (Eng. 4)	1
Algebra (Math. 1)	3	Anal. Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chem. (Chem. 1)	4	General Chem. Chem. 1)	4
Elem. Drawing (M. E. 1)	3	Forge Work (M. E. 9)	2
Wood Work (M. E. 2)	2	Military Drill or Physical Education	1
Forge Work (M. E. 6)	1		
Military Drill or Physical Education	1		
	19		19

SOPHOMORE YEAR.

Expository Comp. (Eng. 2)	2	Calculus (Math. 4)	4
Calculus (Math. 4)	5	General Physics (Phys. 1)	3
General Physics (Phys. 1)	3	Physical Meas. (Phys. 2)	2
Physical Meas. (Phys. 2)	2	Mechanics (C. E. 5)	4
Elect. Machinery (E. E. 1)	2	Elect. Diagram (E. E. 7)	4
Pattern Work (M. E. 2a)	1	Military Drill or Physical Education	1
Foundry (M. E. 4)	1		
P. P. Practice (M. E. 16)	1		
Military Drill or Physical Education	1		
	18		18

JUNIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mechanics (C. E. 5)	4	Applied Elect. (E. E. 5)	4
Dynamos and Motors (E. E. 3)	3	Heat Power (M. E. 18a)	2
Electricity & Mag. (Phys. 5)	4	Dynamo Design (E. E. 8)	3
Steam Engr. (M. E. 7)	2	Electrical Lab. (E. E. 6)	2
Strength of Mtrls. (C. E. 8)	1	Mechanical Lab. (M. E. 15a)	2
E'ectrical Lab. (E. E. 4)	2	Seminar (E. E. 17)	1
Seminar (E. E. 17)	1	Elective	2 or 3
	19		18 or 19

SENIOR YEAR.

Economics (Econ. 5)	3	Alter. Currents (E. E. 11)	4
Alter. Currents (E. E. 9)	4	Electrical Design (E. E. 16)	3
Electrical Design (E. E. 13)	3	Contracts & Spec. (C. E. 23)	1
Electrical Lab. (E. E. 10)	3	Electrical Lab. (E. E. 12)	2
Seminar (E. E. 17)	1	Seminar (E. E. 17)	1
Thesis (E. E. 20)	2	Thesis (E. E. 20)	3
Elective	2 or 3	Elective	3 or 4
	18 or 19		17 or 18

Mechanical Engineering

The purpose of the course in mechanical engineering is to fit its graduates for successfully filling responsible positions as supervising and designing engineers. It furnishes fundamental training in the science, the art and the business of engineering, and prepares for the design, operation, superintendence and management of power plants, heating plants, refrigerating plants, lighting plants, pumping plants, and of the mechanical equipment of mines and railroads; and for the design, manufacture, installation, testing and operation of shop and laboratory machinery, steam and gas engines, and auxiliary equipment.

The course comprises four years' instruction and training by text book, lecture, laboratory and shop practice, based on mathematics, physics, chemistry, mechanics, machine design, structural design and thermodynamics. It is designed to give the student a thorough knowledge of the basic principles of his profession and such technical skill as the application of theoretical principles in every day practice in shop and laboratory will insure. The work of each department—class room, laboratory, shop and designing room—is made to supplement the work of each of the others, so that the graduate beginning his profession has not only a valuable fund of scientific knowledge, but a first-hand acquaintance with sound practice, developed under the supervision of trained men—a balance in his technical equipment attainable in no better way.

MECHANICAL ENGINEERING.

FRESHMAN YEAR.

First Semester		Second Semester	
English Comp. (Eng. 1)	2	English Comp. (Eng. 1)	2
Public Speaking (Eng. 4)	1	Public Speaking (Eng. 4)	1
Algebra (Math. 1)	3	Anal. Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chem. (Chem. 1)	4	General Chem. (Chem. 1)	4
Elem. Drawing (M. E. 1)	3	Forge Work (M. E. 9)	2
Forge Work (M. E. 6)	1	Military Drill or Physical Education	1
Wood Work (M. E. 2)	2		
Military Drill of Physical Education	1		
	19		19

SOPHOMORE YEAR.

Expository Comp. (Eng. 2)	2	Calculus (Math. 4)	4
Calculus (Math. 4)	5	General Physics (Phys. 1)	3
General Physics (Phys. 1)	3	Physical Meas. (Phys. 2)	2
Physical Meas. (Phys. 2)	2	Mechanics (C. E. 5)	4
Mechanism (M. E. 5)	4	Mechanism (M. E. 8)	3
Pattern Work (M. E. 2a)	1	Machine Work (M. E. 17)	2
Foundry (M. E. 4)	1	Military Drill or Physical Education	1
Military Drill or Physical Education	1		
	19		19

JUNIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mechanics (C. E. 5)	4	Machine Design (M. E. 13)	5
Steam Engr. (M. E. 7)	2	Thermodynamics (M. E. 18)	4
Elect. and Mag. (Phys. 5)	4	Mechanical Lab. (M. E. 15a)	2
Valve Gears (M. E. 10)	3	Hydraulics (I. E. 4)	3
Pr. Plant Practice (M. E. 16)	1	Machine Work (M. E. 27)	2
Str. of Materials (C. E. 8)	1		
Machine Work (M. E. 21)	2		
	19		18

SENIOR YEAR.

Economics (Econ. 5)	3	Industrial Engr. (M. E. 25)	2
Gas Power (M. E. 22)	3	Steam Engineering (M. E. 26)	3
Machine Design (M. E. 23)	5	Plant Design (M. E. 29)	2
Power Laboratory (M. E. 20)	2	Engineering Lab. (M. E. 28)	2
Electric Power (E. E. 14)	3	Heat. & Vent. (M. E. 24)	3
Electrical Lab. (E. E. 14a)	2	Contracts (C. E. 23)	1
Seminar (M. E. 11)	1	Seminar (M. E. 11)	1
		Thesis (M. E. 30)	4
	19		18

Chemical Engineering

This course provides for a thorough training in chemical engineering and deals with the application of chemistry and electro-chemistry to manufacture.

In the first two years the student is taught mathematics, English, drawing, general chemistry, physics, etc. These are followed in the junior and senior years by a thorough course in industrial processes, given by lectures, supplemented by laboratory instruction.

The work includes a thorough study of the manufacture of such materials as cements, glass, fertilizers, explosives, alkalies, acids, paints, sugar, paper, etc.

Special attention is given to heat and its application to industrial processes.

Attention is given to the manufacture of gases and the by-products of gas works.

The above work is supplemented by courses in electrical engineering, steam engineering, etc.

Inspection trips are taken to some of the larger industrial plants of Montana in order that the student may examine the work as actually done in manufacturing plants.

CHEMICAL ENGINEERING.

FRESHMAN YEAR.

First Semester		Second Semester	
English Comp. (Eng. 1)	2	English Comp. (Eng. 1)	2
Public Speaking (Eng. 4)	1	Public Speaking (Eng. 4)	1
Algebra (Math. 1)	3	Anal. Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chem. (Chem. 1)	4	General Chem. (Chem. 1)	4
Elem. Drawing (M. E. 1)	3	Forge Work (M. E. 9)	2
Wood Work (M. E. 2)	2	Military Drill or Physical Education	1
Forge Work (M. E. 6)	1		
Military Drill or Physical Education	1		
	19		19

SOPHOMORE YEAR.

Calculus (Math. 4)	5	Calculus (Math. 4)	4
General Physics (Phys. 1)	3	General Physics (Phys. 1)	3
Physical Meas. (Phys. 2)	2	Physical Meas. (Phys. 2)	2
Quantitative Anal. (Chem. 3)	4	Quantitative Anal. (Chem. 3)	4
Mechanism (M. E. 5)	4	Mechanics (M. E. 5)	4
Military Drill or Physical Education	1	Pr. Plant Practice (M. E. 16)	1
		Military Drill or Physical Education	1
	19		19

JUNIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mech. of Materials (C. E. 6)	4	Sound and Light (Phys. 3&4)	4
Organic Chemistry (Chem. 5)	4	Adv. Organic Chem. (Chem. 9)	4
Mineralogy (Geol. 2)	3	Heat Power Engr. (M. E. 18)	4
Elect. and Mag. (Phys. 5)	4	Mechanical Lab. (M. E. 15a)	2
Steam Engr. (M. E. 7)	2	Fuel Analysis (Chem. 17)	3
	19		19

SENIOR YEAR.

Economics (Econ. 5)	3	Cont. and Spec. (C. E. 23)	1
Electric Power (E. E. 14)	3	Ind. Chemistry (Chem. 14)	5
Ind. Chemistry (Chem. 14)	5	Seminar (Chem. 20)	1
Phys. Chemistry (Chem. 19)	4	Thesis (Chem. 21)	3
Str. of Matrl. Lab. (C. E. 8)	1	Elective	7 or 9
Seminar (Chem. 20)	1		
Thesis (Chem. 21)	1		
	18		17 or 19

Architectural Engineering

The rapid increase of population in the State of Montana will result in a healthy growth of our cities and towns. Homes, factories, office buildings and public buildings will be erected.

In addition to the sciences which are common to all engineering courses, this course includes a thorough study of free hand drawing and the drawing of architectural designs. Ancient and modern architecture is studied in all its phases in order that the student may become acquainted with proper architectural forms. The construction of steel and concrete buildings, the sanitation of buildings, the interior and exterior decoration, and illumination, form an important part of the instruction given in this course. The graduates are consequently well prepared to enter the profession of architectural engineering.

ARCHITECTURAL ENGINEERING.

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	2	English Composition (Eng. 1)	2
Public Speaking (Eng. 4)	1	Public Speaking (Eng. 4)	1
Algebra (Math. 1)	3	Anal. Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Elementary Drawing (M. E. 1)	3	Freehand Drawing (Art 3)	2
Wood Work (M. E. 2)	2	Military Drill or Physical Education	1
Forge Work (M. E. 6)	1		
Military Drill or Physical Education	1		
	19		19

SOPHOMORE YEAR.

Expository Comp. (Eng. 2)	2	Calculus (Math. 4)	5
Calculus (Math. 4)	5	Theoretical Mechanics (C. E. 5)	4
General Physics (Phys. 1)	3	General Physics (Phys. 1)	3
Physical Meas. (Phys. 2)	2	Physical Meas. (Phys. 2)	2
Freehand Drawing (Art 3a)	2	Freehand Drawing (Art 3a)	2
Working Drawings (A. E. 1)	3	Elementary Design (A. E. 4)	2
Building Sanitation (A. E. 5)	1	Military Drill or Physical Education	1
Military Drill or Physical Education	1		
	19		19

JUNIOR YEAR.

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mechanics of Matrls. (C. E. 6)	4	Hydraulics (I. E. 4)	3
Graphics (C. E. 28)	2	Roofs and Bridges (C. E. 29)	3
Strength of Matl. Lab. (C. E. 8)	1	Hydraulics (I. E. 6)	1
Steam Engr. (M. E. 7)	2	Specifications and Working Drawings (A. E. 7)	3
Hist. of Architecture (A. E. 3)	3	Hist. of Architecture (A. E. 3)	3
Specifications and Working Drawings (A. E. 6)	3	Estimating (A. E. 8)	2
Elective	2	Elective	2
	19		19

SENIOR YEAR.

Economics (Econ 5)	3	Heat and Ventilation (M. E. 24)	3
Bridge Design (C. E. 30)	4	Bridges and Dams (C. E. 31)	2
Found. & Masonry (C. E. 21)	3	Con. Construction (C. E. 32)	3
Electrical Power (E. E. 14)	3	Steel Mill Building (A. E. 11)	2
Arch. Decoration (A. E. 10)	2	Cont. and Spec. (C. E. 23)	1
Electrical Lab. (E. E. 14a)	2	Illumination (E. E. 19)	2
Elective	2	Cem. and Con. Lab. (C E. 34)	1
		Thesis (A. E. 12)	5
	19		19

Irrigation Engineering

The course in irrigation engineering will meet the needs of those who wish to become proficient in the construction, operation and maintenance of irrigation systems.

Following the freshman and sophomore years, there are courses in irrigation engineering dealing with the principles of irrigation, the location of irrigation systems, the manner of supplying, storing, conveying and distributing irrigation water.

Special attention is also given to hydraulic engineering, as it is important that a student in this course should be thoroughly familiar with rainfall, drainage area, and water power development. These courses include thorough laboratory work.

In order that the student may become thoroughly acquainted with the subject, the courses in irrigation engineering are supplemented by such courses in agriculture as are necessary to understand the purposes for which water is used on the farm and the general management of irrigated lands, as for example; field crops, soil physics and farm management.

IRRIGATION ENGINEERING.

FRESHMAN YEAR.

First Semester		Second Semester	
English Comp. (Eng. 1)	2	English Comp. (Eng. 1)	2
Public Speaking (Eng. 4)	1	Public Speaking (Eng. 4)	1
Algebra (Math. 1)	3	Anal. Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chem. (Chem. 1)	4	Genl. Chemistry (Chem. 1)	4
Elem. Drawing (M. E. 1)	3	Land Surveying (C. E. 1)	2
Wood Work (M. E. 2)	2	Military Drill or Physical Education	1
Forge Work (M. E. 6)	1		
Military Drill or Physical Education	1		
	19		19

SOPHOMORE YEAR.

Calculus (Math. 4)	5	Calculus (Math. 4)	4
General Physics (Phys. 1)	3	General Physics (Phys. 1)	3
Physical Meas. (Phys. 2)	2	Physical Meas. (Phys. 2)	2
General Botany (Biol. 9)	5	Geology (Geol. 1)	3
Plane Surveying (C. E. 2)	3	Mechanics (C. E. 5)	4
Military Drill or Physical Education	1	Elective	2
		Military Drill or Physical Education	1
	19		19

JUNIOR YEAR.

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mech. of Materials (C. E. 6)	4	Irrigation Engr. (I. E. 2)	3
Graphics (C. E. 28)	2	Hydraulics (I. E. 4)	3
Irrigation Engr. (I. E. 1)	3	Hydraulic Lab. (I. E. 6)	1
Field Crops (Agron. 1)	4	Forage Crops (Agron. 11)	4
Str. of Matrl. Lab. (C. E. 8)	1	Canal Surveying (I. E. 10)	3
Found. & Masonry (C. E. 21	3	Elective	3
	19		19

SENIOR YEAR.

Economics (Econ. 5)	3	Hydraulic Engr. (I. E. 5)	3
Electric Power (E. E. 14)	3	Canal Management (I. E. 3)	3
Steam Engr. (M. E. 7)	2	Contracts and Spec. (C. E. 23)	1
Soil Physics (Agron. 2)	5	Mechanical Lab. (M. E. 15a)	2
Farm Management (Agron. 6)	4	Seminar (I. E. 8)	1
Electrical Lab. (E. E. 14a)	2	Thesis (I. E. 9)	3
		Elective	6
	19		19

CIVIL ENGINEERING.

Professor Conkling
Professor Plew
Assistant Professor Snow

The equipment of this department consists of transits, solar attachments, precision levels, hand levels, engineers' wye and dumpy levels, plane tables, alidades, declinators, tachymeters, theodite, sextant and horizon, reflectoscope and lantern, aneroids, engineers' compass, current meters, tide gauge, automatic water registers, model flumes, etc., odometer, vicat needle, Gilmore needles, bricquette machines and molds, weir measuring devises, specific gravity apparatus, fineness scales, polar and rolling planimeters, level and stadia rods, chains, tapes, drafting instruments, blue printing apparatus, complete photographic outfit, laboratory apparatus for testing the materials of construction in tension, compression, flexure and torsion, and drafting rooms well supplied with necessary equipment.

(1) **Land Surveying.** The theory, adjustment and use of instruments in land surveying, in hydrography, in water measurement, in irrigation and drainage, in plotting and mapping. Text: Johnson's Theory and Practice of Surveying. Prerequisite: Math. (2). Laboratory, 2. II., 2.

(1a) **Surveying.** This course includes the theory, adjustment, and use of instruments in land surveying, in hydrography, in water measurement, in irrigation and drainage, in plotting and mapping, and in draughting and office work. Text: Johnson's Theory and Practice of Surveying. Prerequisite: Math. (2). Lectures, 1; laboratory, 2; I., 3.

(2) **Plane Surveying.** The theory and practice of plane surveying, including the computation of areas and the dividing of land, the methods of field, hydrographic, mine and city surveying, barometric and spirit leveling, and the computation of earth work; map drawing and topographic signs; field work with transit level, and plane table; map drawing from students' field notes. Texts: Theory and Practice of surveying, by Johnson; Manual of Surveying, by Pence & Ketchum. Prerequisites: Math. (2). C. E. (1). Laboratory, 3. I., 3.

(3) **Municipal Engineering.** Particular attention is given to city planning; allotting and platting additions; the construction of streets, sidewalks, curbs, gutters and parkings; the different methods for the disposal of refuse; city parks and their paths, walks, and roadways; and to the law affecting the work of the city engineer. Prerequisite: C. E. (2). Lectures, 2. I., 2.

(4) **Railroad Engineering.** Railroad reconnoisance, preliminary and location surveys. Theory and practice in laying out railroad structures, simple and compound curves, easement curves and transition spirals, simple and compensated grades, switches, turnouts and

crossings. Prerequisites: C. E. (2). Field Work (2). Sophomore, II., 2.

(4a) **Summer School in Railroad Engineering.** Required of all freshmen civil engineering students at the end of the second semester. Freshmen act as rodmen, chainmen, axemen, etc. Two credits.

(4b) **Summer School in Railroad Surveying.** Required of all sophomore civil engineering students at the end of the second semester. The work is a continuation of C. E. (4) and provides the field data for the railroad work in the first semester of the junior year. A camp is established and regular field work is carried on for two weeks. Two credits.

(5) **Theoretical Mechanics.** Forces and force systems, center of gravity and centroids, stress, strain, principles of equilibrium, rectilinear and curvilinear motion, work and energy, impulse, momentum and vectors. Text: Maurer's Technical Mechanics. Prerequisite: Math (4). Lectures, 4. II., 4.

(6) **Mechanics of Materials** The elasticity and strength of timber, brick stone and metals. Theory of beams, columns and shafts, with the solution of many practical problems. Text: Merriman's Mechanics of Materials. Prerequisites: Math. (4). C. E. (5). Lectures, 4. I., 4.

(7) **Highway Engineering.** Location, construction, and maintenance of highways. Water, salts, emulsions, tars, and bitumens as binders and dust preventatives. Tests of highway materials. Traffic data in relation to type of road. Methods of drainage, including types of culverts and area of water way. Patented types. Federal, state, and county aid. Highway laws. A study of traction, sanitation, radiation of light and heat, slipperiness, ease of cleaning, repairing, etc., Text: Byrne's Highway Construction. Lectures, 2. I., 2.

(8) **Strength of Materials Laboratory.** Laboratory work in the experimental determinations of the strength and the several moduli of the more important of the materials of engineering. Written reports describing the experiments, with a discussion of the results obtained as compared with the results of accepted experimental data. Prerequisite: C. E. (6). Laboratory, 1. I., 1.

(9) **Railroad Economics.** The making of profiles, field maps, cross-sections, etc., from students' notes of field work. Economics of railroad location, the arrangement of yards, terminals and stations. Making location map. Construction of the roadbed. Maintenance of way and the elements of railroad operation. Prerequisites: C. E. (4) and Summer School in Railroad Engineering (4a) and (4b). Lectures, 1; drawing, 2. I., 3.

(12) **Seminar.** The members of the senior class meet to discuss the articles that appear in certain assigned engineering periodicals. This work helps the student to form the habit of reading the engineering periodicals and gives him a knowledge of the engineering projects that are attracting the attention of his profession. Lectures, 1; II., 1.

(14) **Sanitary Engineering.** System for the collection of sewerage. Methods of sewage treatment and disposal. The design of a sewerage system and a disposal plant. House drainage. Specifications and estimate of cost. Prerequisites: C. E. (1), (3) and (15). Lectures, 2; Drawing, 1. II., 3.

(15) **Public Water Supplies.** Systems of water supply, including purification systems, reservoirs, pipe lines, pumping plants; the design of a water supply purification and distribution system; specifications and estimate of cost. Text: Public Water Supplies, by Turneaure and Russell. Prerequisites: I. E., (4) and (5). Lectures, 2. II., 2.

(17) **Geodesy.** Elements of Geodesy, base line measurements, triangulation, balancing surveys and distributing errors, application of the method of least squares, principles of map projection. Determination of azimuth, latitude and longitude by sun and star observations. Determinations of the true north by observations on Polaris. Prerequisites: Math. (6); C. E. (1), (2) and (4). Field work, 2. I., 2.

(21) **Foundations and Masonry.** This course includes a study of materials and methods employed in the construction of piers, abutments, masonry dams, retaining walls and foundations; economy of construction; strength of joined materials; specifications and costs. Prerequisites: C. E. (6), (28). Lectures, 2; Drawing, 1. I., 3.

(23) **Contracts and Specifications.** The elementary law of contracts and its application to engineering considered, together with the correct form of specifications and the judicial interpretation placed on the technical terms commonly used in engineering specifications. Text: Johnson's Contracts and Specifications. Elective to all engineering students after the sophomore year. Lectures, 1. II., 1.

(27) **Thesis.** The student will be required, before graduation, to present a suitable thesis upon some engineering subject in the line of his course. A copy of the same, together with all original maps, tables, etc., typewritten, bound, and upon specified paper, will be filed with the college and become its property. The student is required to select his subject at the beginning of the senior year. II., 4.

(28) **Graphic Statics.** Analysis of the stresses in roof trusses by the force polygon. Application of the equilibrium polygon to beams and girders. Analysis of stresses in bridge trusses, retaining walls and masonry arches. Prerequisites: Physics (1) and (2); C. E (.5). Laboratories, 2. I., 2.

(29) **Roofs and Bridges.** The theory and computation of stress in roof and bridge trusses under dead, live and wind loads. Locomotive wheel loads on plate girders and bridge trusses. Prerequisites: C. E. (6) and (28). Lectures, 2; drawing, 1; II., 3.

(30) **Bridge Design.** The design of girders and trusses; computations and complete drawings are made for a through plate girder railroad bridge, and for a highway truss bridge. Specifications, bill of

materials and estimate of cost. Prerequisites: C. E. (6) and (29). Lecture, 1; drawing, 3. I., 4.

(31) **Bridges and Dams.** Higher structures, including continuous draw, cantilever and suspension bridges, also metallic arches. The theory and design of masonry walls and arches. The theory and design of dams other than the gravity section. Prerequisites: C. E. (30). Lectures, 2. II., 2.

(32) **Concrete Construction.** The manufacture and properties of hydraulic cement, mortar and concrete. Theory of the proportioning and mixing of concrete. Theory of reinforced concrete. Theory and design of reinforced concrete buildings, arches and other structures. Design of parts of reinforced concrete building. Specifications and costs. Prerequisites: C. E. (6) and (30). Lectures, 2; drawing 1. II., 3.

(34) **Cement and Concrete Laboratory.** Laboratory course in connection with C. E. (32). Each student makes all the standard tests in the cement laboratory. Reinforced concrete beams are made and tested by the students to determine the distribution of stress and the manner of failure under breaking load. Written reports on laboratory experiments. Prerequisites: C. E. (6), (30) and (32). Laboratory, 1. II., 1.

ELECTRICAL ENGINEERING.

Professor Thaler.
Mr. Haines.

The electrical engineering department occupies a two-story stone building and the second floor of a frame building. The electrical laboratory is located on the first floor. The second floor contains class rooms and drafting rooms, a photometer room, a battery room, and a high tension room.

The equipment of the electrical laboratory is very complete, with apparatus of modern type. There are two double current multipolar generators, capacity 15 K. W. These machines may be used as direct current dynamos, as alternators, single, two or three phase; as synchronous motors or as rotary converters.

The two machines are also used for practice in synchronizing, and furnish alternating current for the induction motors, and for the mercury arc rectifier. For direct current work the laboratory contains in addition to the two generators, one Excelsior 15 light arc dynamo, connected to eight series-arc-lamps, arranged for testing purposes; one 15 H. P. Reliance variable speed motor; one 15 H. P. Northern Electric company motor; and one 10 H. P. Siemens and Halske motor. Each motor is provided with a friction brake and other auxiliary apparatus for complete tests of the armature and field resistance, of the magnetic distribution and leakage, and of the efficiency and regulation at different loads; one 6 K. W. Excelsior dynamo may be

used as either a shunt or a compound machine, and is driven by the 10 H. P. motor and arranged for testing purposes.

For alternating current work the laboratory contains, in addition to the two generators, one mercury arc rectifier, capacity 30 amperes at 110 volts; one 2 H. P. single phase Westinghouse induction motor with phase splitter, provided with a prony friction brake for efficiency and regulation tests at different frequencies and at different voltage; one 6 H. P. three phase General Electric Company induction motor, also provided with auxiliary apparatus for testing purposes.

A 150,000 volt testing transformer is used to test insulators for high tension transmission, and to test the insulation resistance of insulating materials.

Seven transformers, six single phase and one three phase, capacities from 1 to 1½ K. W., are available for testing purposes, and for practice in making transformer connections.

A General Electric Company oscillograph with photometric and tracing table attachments, is provided for investigating the wave forms of alternating and oscillatory electro-motive forces and currents.

For general testing the laboratory contains one stationary lamp bank of 136 incandescent lamps, with a current capacity of 130 amperes at 110 volts; the lamps are arranged so that the current can be regulated within a small fraction of one ampere; four portable lamp banks of ten lamps each, arranged so that the lamps can be connected either in series or in parallel; one 900 Ohm iron wire resistance and five iron wire resistances for heavy currents, besides a number of rheostats, switches and current breakers.

The laboratory contains twenty-nine electrical measuring instruments, including nine voltmeters; one Whitney 150-330 volts; one Whitney 15 volts; one Weston 150 volts; one Weston millimeter; one Weston 75-150 volt A. C.; one Westinghouse 150 volt switchboard voltmeter.

There are eight portable ammeters; one 5 ampere D. C. Weston, three Whitney ammeters, capacity 10, 25 and 50 amperes, D. C., respectively; two Hoyt's A. C. ammeters, 10 and 30 amperes respectively; one G. E. ammeter with series transformer, 120 amperes A. C., and one Westinghouse, 120 amperes.

The department has four portable wattmeters; one Westinghouse, with series transformer, capacity 100 amperes at 200 volts; one Hoyt, capacity 1,500 K. W., one Weston, with multiplier, 2 amperes at 2,250 volts; one G. E. Co., wattmeter, capacity 10,000 watts.

The apparatus for calibrating instruments consist of one Leeds potentiometer with standard cell and standard resistance, one Kelvin, standard watt balance, one Westinghouse precision voltmeter and one Westinghouse precision wattmeter.

One mercury vapor lamp, 15 arc lamps, series, constant potential, alternating and direct current, Tungsten, Tantalum and Nernst lamps are available for testing purposes.

In the photometer room is a Willyoung station photometer with universal rotator and bunsen screen for testing the candle power, distribution of light, and the efficiency of incandescent lamps.

The battery room contains a storage battery of 56 cells at 60 ampere hours capacity, of the following types: 10 chloride accumulators, 10 National Battery Company's unit accumulator, 10 Willard cells and 26 American cells. The batteries furnish current for calibrating instruments and are also available for testing purposes.

The equipment of the wireless telegraph station consists of a 5 K. W. sending set including transformer, condenser, Marconi Rotary spark gap, Marconi oscillation transformer, 50 ampere sending key and a 350-foot aerial; and a receiving set including tuning coils, ferron and Audion detectors and amplifier, and head-piece telephone receivers. Ammeters and Wavemeters are available for testing purposes.

Before beginning work a student must provide himself with one of the following sets of drawing instruments or a set of equal quality: K. & E. No. 896 NCP with No. 523½ pen, or Dietzgen No. 937 C with No. 508 pen.

(1) **Electrical Machinery.** Lectures on the construction, care and operation of commercial electrical machines and apparatus, including batteries, electric lights, dynamos, motors, alternators, transformers and electrical measuring instruments. Text: Introduction to Electrical Engineering, by H. H. Norris. Lectures, 2. I., 2.

(3) **Dynamos and Motors.** Principles of electro-magnetism, theory of dynamo electric machines, the design, construction and regulation of direct current dynamos and motors. Prerequisites: Physics (1) and Math. (4). Text book: Elements of Electrical Engineering, by Franklin and Esty. Lectures, 3. I., 3.

(4) **Electrical Laboratory.** Laboratory tests to determine armature and field resistance, magnetic leakage coefficients, characteristic curves and the efficiency and regulation of various types of direct current machines. Textbook: Laboratory and Factory Tests in Electrical Engineering, by Sever & Townsend. Prerequisites: Physics (2) and (6). Laboratory, 2. I., 2.

(5) **Applied Electricity.** Methods and calculations of wiring, theory of primary cells and storage batteries, and electric light. Text book: Elements of Electrical Engineering, by Franklin & Esty. Lectures, 4. II., 4.

(6) **Electrical Laboratory.** Tracing circuits and wiring, calibrating instruments, efficiency tests of storage batteries, and the candle power of incandescent lamps. Textbook: Laboratory and Factory Tests in Electrical Engineering, by Sever & Townsend. Prerequisite: Physics (2). Laboratory, 2. II., 2.

(7) **Electrical Diagrams.** Conventional methods of representing electrical wiring and appliances. Diagrams of D. C. switchboards and of electric light wiring. General and detail drawings of dynamos.

Lectures on wiring. National Electrical Code and dynamo construction. Lecture, 1. laboratory, 3. II., 4.

(8) **Dynamo Design.** Problems in designing electro-magnets, dynamos and motors. Complete working drawings and specifications to accompany each design. Reference: Design of Dynamos, by S. P. Thompson. Prerequisite: Dynamo drawing. Laboratory, 3. II., 3.

(9) **Alternating Currents.** Theory of alternating currents, properties of alternating current circuits, principles of alternators, transformers, rotary converters and induction motors, methods of testing alternating current apparatus. Textbook: Alternating Current Machines, by Sheldon, Mason & Hausmann. Prerequisite: Physics (5). Lectures, 4. I., 4.

(10) **Electrical Laboratory.** Laboratory tests of single phase alternating current generators, motors and transformers, calibration of alternating current measuring instruments and meters. Textbook: Laboratory and Factory Tests in Electrical Engineering, by Sever & Townsend. Prerequisite Physics (6). Laboratory, 3. I., 3.

(11) **Alternating Currents.** Development of the symbolic method of Steinmetz, the solution of problems in transformer design and calculation of transmission line by the use of the algebra complex numbers and by vector diagrams. Textbook: Alternating Current Phenomena, by Steinmetz. Prerequisite: Alternating Currents (9). Lectures, 4. II., 4.

(12) **Electrical Laboratory.** Laboratory tests of polyphase alternating current apparatus, including generators, motors, transformers and converters. Efficiency and regulation tests of a mercury arc rectifier, connecting transformers for transforming from three phase to two phase. Textbook: Laboratory and Factory Tests in Electrical Engineering, by Sever & Townsend. Prerequisite: Electrical Laboratory (10). Laboratory, 2. II., 2.

(13) **Electrical Desi n.** Drawing and design of alternating current apparatus, circuits, and power plants. Open to students taking E. E. (9) and E. E. (11). Laboratory, 3. I., 3.

(14) **Electric Power.** Theory and construction of direct and alternating current generators, motors, transformers, and storage batteries; principles of power transmission and distribution. Textbook: Electrical Engineering, by T. Sewell. Lectures, 3. I., 3.

(14a) **Electrical Laboratory.** Efficiency and regulation tests of batteries and direct and alternating current generators and motors; efficiency and polarity tests of transformers. Textbook: Experiments in Applied Electricity, by Rowland and Creagmile. Laboratory, 2. I., 2.

(15) **Wireless Tele raphy.** Theory and development of wireless telegraphy; commercial apparatus and instruments for sending and receiving stations. Experimental tests. Textbook: Handbook of Wireless Telegraphy, by J. Erskine Murray. Prerequisite: Physics (5). Lectures, 2; laboratory, 1. I., 3.

(16) **Electrical Design.** Design and drawing of a transformer

or induction motor to conform with certain specifications for efficiency, including the calculations of the weight and cost of the material. Prerequisite: E. E. (9). Laboratory, 3. II., 3.

(17) **Seminar.** Weekly meeting for the purpose of discussing current electrical engineering literature. Lectures, 1. I. and II., 2.

(18) **Special Design.** Design and construction of some special electrical apparatus or machine. Elective for seniors. Laboratory, 3. I. or II., 3.

(19) **Illumination.** Sources of light, laws of photometry and measurement of light, calculation of illumination, electric light wiring, Underwriters' rules and symbols of the National Contractors' association. Lectures, 2. II., 2.

(20) **Thesis.** Before graduating each student must present a suitable thesis upon some engineering subject in line with his course. One copy of the thesis will be filed in the college library as the property of the college. The subject for the thesis must be chosen at the beginning of the senior year. (5). I. and II., 5.

MECHANICAL ENGINEERING.

Professor Dearborn.
Assistant Professor Challender.
Mr. Miller.
Mr. Kately.
Mr. Park.
Mr. Homann.

The facilities provided for the instruction and practice in the department of mechanical engineering include class rooms, drawing room and office occupying the south half of the basement of Montana Hall, wood shop, forge shop, iron and brass foundry, machine shop, office and reading room in the shop building, mechanical engineering laboratory, and the power plant of the college.

The drawing room is furnished with desks and drawers for one hundred and fifty-four students, and with numerous models, machine parts, and blue prints of trade machinery. The equipment includes also demonstration apparatus, blue print facilities, beam compasses, protractors, coöntograph and universal drafting machine. The work in drawing and design is carried on in such a way as to bring out its relation to the subsequent work in the shops, commercial practice being emphasized.

The equipment available for steam and gas engine tests comprises, in part, the following: A 7x7 inch vertical steam engine with eccentric adjustable; an 8x12 inch automatic cut-off Woodbury engine, with water cooled brake wheel, connected up with a 50 H. P. Dean Bros. surface condenser and arranged to run condensing or non-condensing and with or without live or exhaust steam in the cylinder jacket; an 11x12 inch automatic cut-off Lycoming engine direct-connected to a 40 K. W. direct current generator, furnishing light and power for the college; a 21 H. P. Reeves throttling governor gasoline engine; a 12 H. P. two-stroke cycle Ellis oil engine; several small gasoline engines; an 8x8 Ingersoll-Rand air compressor; a 6½ inch by 9 inch Wolf ammonia refrigerating machine, driven by a Corliss engine; all necessary brakes, generators and lamp banks for loading the engines; scales, meters, tanks, etc. In addition there are planimeters, separating and throttling calorimeters, thermometers, one Tabor (outside spring) gas indicator, one Thompson steam indicator, two sets steam indicators, with electro-magnetic device for taking simultaneous cards, one set ammonia indicators, standard pressure gauges, apparatus for testing gauges and indicator springs under steam pressure and a Crosby oil pressure gauge testing outfit.

A one hundred twenty-five horse-power Root water tube boiler, a one hundred and twenty-seven horse-power Stirling water-tube boiler, a Baldwin locomotive, of the 4-4-0 class, an Advance compound trac-

tion engine, several oil and gasoline tractors, together with pumps, ejectors, feed water heaters, fans, etc., and the station heating plant, furnish extensive facilities for the investigation of problems related to power production, heating and ventilation.

The shops are equipped with standard machinery, and tools for working wood and metal.

The wood shop measures 36x50 feet and is furnished with modern wood-working machinery, including a 20-inch Fay planer, a 14-inch circular pattern saw, a 36-inch band saw, a Fay universal jointer, a Fay and Egan friezer, a jig saw, foot mortiser, trimmer, a 16-inch pattern lathe, seven 10-inch lathes with turning tools for thirty-six students, and seventy-two complete sets of carpenter tools, with benches for joinery, house carpentry, pattern work and cabinet work.

The forge shop is 28x60 feet and contains nineteen down draft power forges with Sturtevant blowers, a 50-lb. power hammer, shear, grinder, and a full equipment of anvils and small tools. In the required work a graded series of exercises leads the student from simple drawing and upsetting to size, to complex forging and tool making, hardening and tempering, all the work being done from working drawings.

The foundry, 30x48 feet, is equipped with a No. 1 Whiting cupola having a melting capacity of one ton of iron per hour, a brass furnace, core oven, crucibles, flasks and patterns. The work comprises bench and floor moulding, cupola and brass furnace practice, the product consisting of castings of machine parts, test bars, brass bronze and other alloys for bearing metal, ornamental pieces, etc.

The machine shop measures 60x72 feet, and adjoining it are the tool room, stock room, office, lavatory and locker room. The equipment includes an 18-inch Davis and Egan, a 16-inch LeBlond and three 16-inch Flather engine lathes, a 14-inch Lodge and Shipley patent head tool room lathe, a 22-inch Flather planer, a 16-inch Davis and Egan shaper, a Gisholt tool grinder, a 28-inch Cincinnati drill, a 20-inch Prentice drill, a 14-inch sensitive drill, a 24-inch Barnes grinder, a 6-inch pipe machine, speed lathe, power hack saw, etc., and in the tool room a No. 1 Cincinnati universal milling machine, a Cincinnati universal grinder, a Yankee drill grinder, a brazing and tempering outfit, besides a complete equipment of small tools.

(1) **Mechanical Drawing.** The use of drawing instruments and plain lettering; problems in geometric construction to teach accuracy in the use of instruments; orthographic projection, dimensions, arrangement, titles; tracing and blue-printing. Before beginning work, a student must provide himself with one of the following sets of drawing instruments or a set of equal quality. K. & E. No. 896 NCP with No. 52½ pen, or Dietzgen No. 937C with No. 508 pen. Laboratory, 3. I., 3.

(2) **Wood Work.** A graded set of problems is given with instruction in the proper use and care of carpenters' tools and practice in working to dimensions from blue-prints, followed by a course in build-

ing construction, roof framing and mill work. Tools required: One B. & S. caliper rule. Laboratory, 2. I., 2.

(2a) **Pattern Work.** A graded series of exercises in wood turning, followed by lectures and practice in the construction of wood patterns for use in the foundry. Tools required: one 6-inch steel rule, 5-inch cutside calipers. Prerequisite: M. E. (2). Laboratory, 1. I., 1.

(3) **Descriptive Geometry.** Projections of lines, plane surfaces and solids; intersections, tangents to curves and surfaces; problems in warped surfaces; practical applications. Text: Phillips & Millar. Lectures, 1; laboratories, 3. II., 4.

(4) **Foundry.** The instruction includes practice in floor and bench molding, core making, and in pouring castings of iron, brass and other alloys. Laboratory, 1. I., 1.

(5) **Mechanism.** A study of the relative motions of machine parts, including rolling cylinders and cones, lobed wheels, belts, levers, cams, linkwork, parallel and straight line motions, as applied in engine indicators, indicator reducing motions and motor-car steering mechanisms. The design of cams and quick-returns for machine tools, with their velocity and acceleration diagrams. Text: Schwamb and Merrill, Elements of Mechanism. Lectures, 2; laboratory, 2. I., 4.

(6) **Forge Work.** A graded set of exercises in iron forging designed to teach the management of the forge fire, and the operations of drawing, upsetting and forming with simple welding. Tools required: one B. & S., slide caliper rule. Laboratory, 1. I., 1.

(7) **Steam Engineering.** A study of steam boilers, their classification and construction, their settings, furnaces and chimneys, and of the construction and use of the various accessories and appliances found in the boiler room; a study of combustion and furnace efficiency, and of the principles underlying the economical transfer of heat from the furnace to the water. Scale, corrosion and feed water treatment are given considerable attention. Text: Shealey Steam Boilers. The course must be preceded or accompanied by (16). Prerequesites: Chemistry (1) and physics (1) and (2). Lectures, 2. I., 2.

(8) **Mechanism.** A continuation of (5) in the study of gearing; the cycloidal and involute systems, spur, bevel, helical and worm gears. The construction of the tooth. Change gears, gearing in train, epicyclic trains with special application to automatic feeds and differential transmission for tractors. Lectures, 1; laboratory, 2. II., 3.

(9) **Forge Work.** A continuation of (6) in welding iron, steel and tool steel; power forging, forging, hardening and tempering high-carbon and alloy-steel tools. Laboratory, 2. II., 2.

(10) **Valve Gears.** An analytic and graphic study of engine valve mechanisms, and the use of the Zeuner, Bilgram and other diagrams in the design of valve gear to fulfill given conditions. Reversing gear, the Stephenson and Walschaert gear as applied to locomotives and tractors, drop cut-off and non-releasing gears are analyzed and com-

pared. Prerequisite: Mechanism (5). Lecture, 1; laboratory, 2. I., 3.

(11) **Seminar.** Weekly meetings for the presentation and discussion of papers upon assigned topics pertaining to mechanical engineering. Lecture, 1. I. and II., 2.

(13) **Machine Design.** A study of machines with respect to materials, form and strength of parts, and methods of construction. The development of rational and empirical formulae, the construction and interpretation of graphical charts involving engineering principles and data, and the geographical solution of problems involving stresses in cranes, structural members and machine parts. A note book is required showing calculations for all problems assigned, with complete working drawings of a hydraulic or geared press, riveter, punch or shear, a geared pump, or similar machine. Text: Kimball & Barr. Prerequisites: Valve Gears (10); Mechanics, (6). Lectures, 3; laboratory, 2. II., 5.

(15a) **Mechanical Laboratory.** The calibration and adjustment of micrometers, planimeters, tachometers, spring balances, engine indicator springs, traction dynamometer, pressure gauges, with their use in determining the efficiency of hoists, screws, belt drives and the brake and indicated horse-power of steam and gasoline engines. The course will include the determination of clearance in engines, and valve setting by measurement and by the card, with criticism of faulty cards. Reference: Carpenter & Diedrich's Experimental Engineering, and Moyer's Power Plant Testing. Prerequisites: Physics, (1); M. E. (7); M. E. (16); Laboratory, 2. II., 2.

(16) **Power Plant Practice.** Each student spends forty hours per semester as assistant in the college power plant, directly under a first-class stationary engineer, receiving instruction in the handling of boilers, pumps, engines, heating apparatus and electrical machinery. Laboratory, 1. I. and II., 2.

(17) **Machine Work.** Instruction and practice in chipping, filing, laying out, fitting, soldering and brazing. The course will require also a limited amount of work in advanced foundry practice. Tools required: one 16-inch steel rule; 5-inch outside calipers. Prerequisites: Forge, (9); foundry, (4). Laboratory, 2. II., 2.

(18) **Thermodynamics.** A study of the principles and their technical application to gases, saturated and superheated vapors, and mixtures, comprising cycle processes, the flow of fluids through nozzles, and throttling processes, from the physical analytical and graphical standpoint. The work includes the solution of numerous practical problems involved in the design and operation of steam and gas engines, steam turbines, steam calorimeters, injectors, air compressors and refrigerating machinery. Text: Goodenough, Principles of Thermodynamics. Prerequisites: M. E. (7) and (16). Lectures, 4. II., 4.

(18a) **Heat Power.** An elementary course dealing with the thermodynamic principles involved in the operation of steam engines and

turbines, gas and oil engines. For electrical engineering students. Prerequisites: M. E. (7) and (16). Lectures, 2. II., 2.

(20) **Power Laboratory.** Indicator practice as applied to air compressors, gas and steam engines, pumps, locomotives. Fuel consumption tests of gasoline and oil engines. Calorimetric determination of the quality of steam. Tests of injectors, pumps and engines. Prerequisite: Thermodynamics (18). Laboratory, 2. I., 2.

(21) **Machine Work.** Practice with instruction in drilling, boring, turning, thread and gear cutting. Tools required: Six-inch steel rule, 5-inch outside and inside calipers, center gauge. Prerequisite: (17). Laboratory, 2. I., 2.

(22) **Power Engineering.** An extension of (18) in a study of the performance and design of gas motors, gas producers and other gas machinery, and air machinery from the thermodynamic standpoint. Text: Ennis, Applied Thermodynamics; Heck, Steam Engine and Turbine. Lectures, 3. I., 3.

(23) **Machine Design.** A continuation of (13) with application in the design of reciprocating parts, fly wheels and governors of engines. Balancing, stresses in turbine discs, and critical velocity of shafts are discussed. Working drawings are made of some needed laboratory machine involving the principles studied. Text: Kimball & Barr. Reference: Lanza's Dynamics of Machinery. Lectures, 3; laboratory, 2. I., 5.

(24) **Heating and Ventilation.** A course designed to cover the principles of heating buildings by the various systems using steam, air and hot water, and of ventilation with calculations for specific installations, specifications, and estimate of costs. Text: Hoffman, Handbook. Prerequisite: M. E. (7). Lectures, 2; laboratory, 1. II., 3.

(25) **Industrial Engineering.** The organization and management of industrial establishments; cost accounting, distribution of expenses, depreciation and amortization; systems of compensating labor. Text: Kimball's Principles of Industrial Organization. Lectures, 2. II., 2.

(26) **Steam Engineering.** An extension of (18) with special application to the performance and design of steam motors and refrigerating machines. Lectures, 3. II., 3.

(27) **Machine Tool Work.** Advanced work on lathe, milling machine and grinder. The manufacture of reamers, drills, taps, mills, and dies. The heat treatment of high speed steel. Laboratory, 2. II., 2.

(28) **Engineering Laboratory.** A continuation of (20), including efficiency tests of heating, ventilating, compressed air, refrigerating and power plant equipment, steam and gas power plants and machinery, locomotive tests. Laboratory, 2. II., 2.

(29) **Plant Design.** The course comprises the design of a plant for a specific purpose—i. e., a heating, pumping, lighting, refrigerating, compressed air or shop plant. Lectures and recitations cover the location and construction of the buildings; heating, ventilating, lighting and fire protection systems; the working equipment and its arrangement;

while working drawings are made showing the location of equipment, with calculations and specifications for certain details. Laboratory, 2. II., 2.

(30) **Thesis.** Before graduating, the student is required to present an acceptable thesis involving an investigation of some problem related to mechanical engineering, which will become the property of the college. The work will be done under the supervision of the head of the department, but the student will devise his own methods. The subject must be selected by November 15 of the senior year. II., 4.

(32) **Automobile Practice.** A laboratory study in detail of automobile and motor truck engines, carburetors, ignition and lighting systems, oiling systems, transmissions, and differentials, clutches, steering gear, brakes and tires. Various makes will be dismanteled and reassembled, adjusted and tested on the stand. Systematic locating of trouble, with a limited amount of driving, will be included. Elective for all junior and senior college students, and for sophomore engineering students. Number in class will be limited. Deposit required, $3.00. Laboratory, 2 credits with lectures. I. or II., 2.

(33) **Tractor Power.** A laboratory course, with lectures, in the principles and operation of steam, gasoline and oil tractors. Elective for all college students. Deposit required, $3.00. Laboratory, 2. II., 2.

ARCHITECTURAL ENGINEERING.

Professor W. R. Plew.

(1) **Working Drawings.** Detailing on a large scale, floors, windows, stairs, cornice, cabinet making and conventional methods in architectural drawing. Laboratory, 3. I., 3.

(2) **History of Architecture.** A study of architectural design from the early period to modern times; evolution of architectural forms from early Egyptian to modern times. Architecture of various countries and periods. Lecture, 3. I., 3.

(3) **History of Architecture.** Rendering of famous examples of period architecture. Lecture, 1; laboratory, 2. II., 3.

(4) **Elementary Design.**. Problems in rendering of the orders and sketch problems involving simple composition. Laboratory, 2. II., 2.

(5) **Building Sanitation.** Design and installation of plumbing; removal of waste; sewage disposal; water supply and fixtures in dwellings and public buildings. Lecture, 1. I., 1.

(6) **Specifications and Working Drawings.** Plan and framing problems; ballon framing, detailing of walls, etc. Laboratory, 3. I., 3.

(7) **Specifications and Working Drawings.** A continuation of A. E. (6), taking up masonry details; stereotomy, and building specifications. Lecture, 1; laboratory, 2. II., 3.

(8) **Estimating.** Methods of estimating building costs with practice in the same. Lectures, 2. I., 2.

(10) **Architectural Decoration.** Interior and exterior ornamental design and finish of buildings. Laboratory, 2. I., 2.

(11) **Steel Mill Building.** Study of design of trusses in framed bents; three hinged arches; mill building construction, slow burning and fire proof construction, specifications and contracts. Prerequisites: C. E. (28) and (29). Lecture, 1; laboratory, 1. II., 2.

(12) **Thesis.** II., 5.

IRRIGATION ENGINEERING.

Professor————————

(1) **Irrigation Engineering.** History of irrigation; the principles of irrigation and the location of irrigation systems; details of irrigation systems. Lectures, I., 3.

(2) **Irrigation Engineering.** Manner of supplying, storing, conveying and distributing irrigation water; irrigation laws; management of irrigation systems. Prerequisites: I. E. (1) and (4). Lectures, 3. II., 3.

(3) **Canal Management.** Canal management, seepage, and drainage. Prerequisite. I. E., (2). Lectures, 3. II., 3.

(4) **Hydraulics.** Theoretical hydraulics, hydraulic measurements; flow of water through orifices, over weirs, through pipes, conduits and canals. Text: Merriman's Hydraulics. Prerequisites: Mathematics, (1), (2) and (4); physics, (1) and (2). Lectures, 3. II., 3.

(5) **Hydraulic Engineering.** Precipitation, drainage area, runoff, water power development. Prerequisite: I. E., (4). Lectures, 3. II., 3.

(6) **Hydraulic Laboratory.** Flow of water over weirs, through nozzles and pipes, etc. Flow of water in open channels. Prerequisite: I. E., (4). Laboratory, 1. II., 1.

(7) **Pumping for Irrigation.** Small rotary and reciprocating pumps. Steam, gas and oil engines used for pumping. Electric pumps. Lectures, 3. II., 3.

(8) **Seminar.** Current Literature, reports and discussions. II., 1.

(9) **Thesis.** II., 3.

(10) **Canal Surveying.** The theory and practice of canal surveying, computation of earth work, and field location of canals for irrigation. Prerequisite: C. E. (1). Lectures, 1. Field, 2. II., 3.

CHEMICAL ENGINEERING.

Professor Cobleigh.
Assistant Professor Barnes.

(14) **Industrial Chemistry.** Lectures on the general operations common to many chemical industries such as crushing, grinding, calcination, fusion, distillation, filtration, crystalization, etc., and the types of machinery used in these operations. Lectures on some of the more important technical chemical processes including the following topics: Lime, mortar, cement, refractory materials, iron, steel, copper, glass, fertilizers, explosives, alkalies, acids, paint, pigments, soap, sugar, paper. The lectures are illustrated by charts, models, lantern slides and museum specimens of raw materials and finished products. Laboratory exercises are selected to supplement the class room work and are taught from the standpoint of chemical engineering. Inspections and reports on various industrial plants in the state are required in the course. Three lectures and two laboratory periods per week. Not offered in 1915-16. Prerequisites: Chemistry (3, (4) and (5). I. and II., 10.

(17) **Fuel Analysis.** This is a course in the production and analysis of solid, liquid and gaseous fuels, illuminating gas, and lubricating oils. Prerequisite: Chemistry (14). II., 3.

(18) **Water Analysis.** Lectures and laboratory practice in the chemical examination of potable waters, of water for industrial purposes and steam raising, of sewages, and of air. Lectures on water purification and softening, and sewage treatment, and also the interpretation of water analysis. Prerequisites: Chemistry (1), (2) and first semester of Chemistry (3). II., 4.

(19) **Physical Chemistry.** A course in theoretical chemistry consisting of lectures, recitations assigned problems, and laboratory work. The discussions include the following topics: The gas laws, thermodynamics, solutions, chemical mechanics, equilibrium in electrolytes, and electro chemistry. Text book: Morgan's Physical Chemistry for Electrical Engineers. Prerequisite: Chemistry, (3). I., 4.

(20) **Seminar.** In order to develop in the student a habit of careful reading, each student will be required to make abstracts of articles on assigned subjects from the leading journals, and present them at weekly meetings of the students and department instructors where the topics are freely discussed. Students are thus kept in touch with the progress of the science. I. and II., 2.

(21) **Thesis.** Students in the chemistry course may in the senior year prepare a graduate thesis on some subject which will involve considerable work and as much originality as possible. I. and II., 4.

College of Applied Science

The departments comprised in the College of Applied Science have a two-fold duty to perform.

(1) They give instruction and training in the fundamental sciences as applied in agriculture, engineering and home economics. A large and important part of the student's work in these major divisions of the institution is given in the science departments.

(2) They also offer several courses of instruction in which the main object is to prepare specialists in the various branches of the basic sciences. These courses also give an excellent general training and may be taken by those students of agriculture, engineering and home economics, who desire to give more attention to the fundamental and less to the more specialized branches of agriculture, engineering and home economics.

The courses of instruction in the college of applied science, all leading to the degree f bachelor of science, are as follows:

1. Botany and Bacteriology.
2. Zoology and Entomology.
3. Chemistry.

 Options:

 (a) Agricultural Chemistry.
 (b) Food Chemistry.
 (c) Bio-Chemistry.

4. Industrial Chemistry.

Recognizing that beginning students will be benefited by an opportunity to spend at least one year in the institution before committing themselves to a line of study to be followed, the work in the freshman year has been made the same in courses 1, 2 and 3, while in course 4 the freshman year is like that of the engineering course. During this first year the student takes up a considerable variety of studies and often learns what line of work he is best adapted for. At the opening of the sophomore year he can change courses within the same group without loss of time. Again, the freshman year in the agricultural courses, listed elsewhere in the catalog is so much like the freshman year in the first three courses that usually a change in either direction can be made without inconvenience. In the same way changes can be made between the industrial chemistry course and those in engineering.

Botany and Bacteriology

Of the sciences that are fundamental to agriculture, botany and bacteriology are among the most important. Through botany we learn of the different kinds of plants, their structure, nutrition, growth and reproduction, and the fungous parasites responsible for many plant diseases. Through bacteriology, we learn of plant and animal diseases and of important chemical changes brought about by micro-organisms in soil, dairy products, silage and other kinds of organic matter. While botany and bacteriology have other aspects besides those relative to agriculture the latter are especially emphasized in this course.

The different botanical and bacteriological subjects taught here have, then, two major purposes, aside from their disciplinary value. One is to furnish a substantial groundwork for students intending to follow the practice of agriculture. The other is to train men for professional careers in botany, plant pathology, agricultural bacteriology and related subjects.

Every effort is made to maintain in this course the high standard found in similar courses of undergraduate work in the larger universities. A number of the best students get the additional opportunity of working in the laboratories of the experiment station, where, in addition to making part of their expenses, they can become familiar with the methods used in research work in this department. In addition to this experience considerable opportunity is offered for practical work in the college herbarium which is by far the largest in the state and one of the largest in the northwest.

This course is characterized by a liberal amount of work in the other sciences, especially chemistry, and enough elective space for courses in applied agriculture, language, etc.

BOTANY AND BACTERIOLOGY.

FRESHMAN YEAR.

First Semester		Second Semester	
English Comp. (Eng. 1)	2	English Comp. (Eng. 1)	2
Public Speaking (Eng. 4)	1	Public Speaking (Eng. 4)	1
General Chem. (Chem. 1)	4	General Chem. (Chem. 1)	4
General Botany (Biol. 9)	5	General Des. Phys. (Phys. 1a)	5
Trig. and Logs. (Math. 2a) —or— Statistics (Math. 7)	3	Elective	4 to 6
Elective	2 to 3	Military Drill or Physical Education	1
Military Drill or Physical Education	1		
	18 to 19		17 to 19

SOPHOMORE YEAR

Expository Comp. (Eng. 2)	2	Expository Comp. (Eug. 2)	2
Organic Chemistry (Chem. 5)	4	Agr. Chemistry (Chem. 7)	5
Invertebrate Zoology (Biol. 1)	4	Economic Entomology (Biol. 4)	4
*Field Crops (Agron. 1)	4	Geology (Geol. 1)	3
*Fruit Growing and Gardening (Hort. 10)	4	Systematic Botany (Biol. 17)	4
Military Drill or Physical Education	1	Military Drill or Physical Education	1
	19		19

JUNIOR YEAR

Advanced Comp. (Eng. 3) —or— English Literature (Eng. 10)	2	Advanced Comp. (Eng. 3) —or— English Literature (Eng. 10)	2
General Bacteriology (Biol. 12)	5	San. Bacteriology (Biol. 16)	2
Quant. Anal. (Chem. 3)	5	Plant Physiology (Biol. 10)	4
Meteorology (Phys. 10)	3	Plant Pathology (Biol. 11)	4
Elective	2 to 4	Organic Evolution (Biol. 14)	3
		Elective	2 to 4
	17 to 19		17 to 19

SENIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Psychology (Phil. 1)	3	Sociology (Econ. 4)	3
Thesis (Biol. 15)	5	Advanced Econ. Ent. (Biol 6) —or—	4
Elective	7 to 9	Phys. and Anatomy (Biol. 3)	5
		Thesis (Biol. 15)	5
		Elective	3 to 5
	17 to 19		17 to 19

*Women may elect other subjects.

Zoology and Entomology

At the present time there are numerous openings for persons trained in the various branches which may be grouped together under the general heading of zoology and entomology. An enumeration of some of the lines will point out the kinds of positions that are open and at the same time indicate in general the character of training required for each.

(1) Research work in the various experiment stations. These positions are very desirable as they offer excellent compensation and an opportunity to follow attractive professional work.

(2) Teaching in colleges and universities. Many of these positions are in agricultural colleges and present a very attractive field for young men.

(3) Research positions in the various federal bureaus and departments chiefly in the bureau of entomology and other divisions of the United States Department of Agriculture. These positions are remunerative and attractive.

(4) State entomologists and assistants in state entomologists' offices. Many states have established these offices and furnish good opening for graduates in entomology.

(5) Besides the above there are various openings for specialists in research laboratories and endowed institutions.

It should not be overlooked that this course is especially well adapted for purposes of general education through the electives allowed, in combination with the prescribed work in biology, chemistry, mathematics, physics, geology, English, economics, the student can make up a wide variety of subjects. These electives may be applied to more science, such as biology, chemistry and physics on the one hand or to subjects in home economics and agriculture.

The course also furnishes an excellent preliminary training for professional work such as medicine and veterinary science.

ZOOLOGY AND ENTOMOLOGY.

FRESHMAN YEAR.

First Semester		Second Semester	
English Comp. (Eng. 1)	2	English Comp. (Eng. 1)	2
Public Speaking (Eng. 4)	1	Public Speaking (Eng. 4)	1
General Chem. (Chem. 1)	4	General Chemistry (Chem. 1)	4
General Botany (Biol. 9)	5	General Physics (Phys. 1a)	5
Trig. and Log. (Math. 2a) —or— Statistics (Math. 7)	3	Elective	4 to 6
Elective	3	Military Drill or Physical Education	1
Military Drill or Physical Education	1		
	19		17 to 19

SOPHOMORE YEAR

Expository Comp. (Eng. 2)	2	Expository Comp. (Eng. 2)	2
Organic Chemistry (Chem. 5)	4	Agricultural Chem (Chem. 7)	5
Invertebrate Zoology (Biol. 1)	4	Geology (Geol. 1)	3
*Field Crops (Agron. 1)	4	Systematic Botany (Biol. 17)	4
*Fruit Growing and Gardening (Hort. 10)	4	Entomology (Biol. 4)	4
Military Drill or Physical Education	1	Military Drill or Physical Education	1
	19		19

JUNIOR YEAR

Advanced Comp. (Eng. 3) —or— Literature (Eng. 10)	2	Advanced Comp. (Eng. 3) —or— Literature (Eng. 10)	2
General Bacteriology (Biol. 12)	5	Animal Physiology and Anatomy (Biol. 3)	5
General and Systematic Entomology (Biol. 5)	4	Plant Physiology (Biol. 10)	4
Vertebrate Zoology (Biol. 2)	4	Advanced Economic Entomology (Biol. 6)	4
Elective	2 to 4	Elective	3 to 4
	17 to 19		17 to 19

SENIOR YEAR

Psychology (Phil. 1)	3	Sociology (Econ. 4)	3
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Embryology (Biol. 13)	4	Plant Pathology (Biol. 11)	4
Thesis (Biol. 15)	5	Thesis (Biol. 15)	5
Elective	3 to 5	Elective	3 to 5
	17 to 19		17 to 19

*Women may elect other subjects.

Chemistry

Two college courses in chemistry are offered by the science division:

I. **Chemistry.** In this course agriculture or home economics subjects, biology and language may be elected as minor subjects.

II. **Industrial Chemistry.** In this course engineering, mathematics, physics and language may be elected as minor subjects.

It will be noted that in the course in chemistry outlined on the opposite page that mathematics and physics are not prominent, but that biology is the principal minor subject. Electives are offered in each year of the course in order that the student may adapt his training, to one of the following special fields. The student must elect one of the following options.

1. **Agricultural Chemistry.** In this option electives should be chosen from the various sub-courses in agriculture, biology, chemistry and language. This will give the student an excellent training in scientific agriculture and prepares for positions in agricultural colleges and experiment stations, and the government service.

2. **Food Chemistry.** This option is for women who wish to make food chemistry a major subject. Electives should be chosen from home economics courses, biology, chemistry and language.

3. **Bio-Chemistry.** Electives in this option should be taken mainly from biology, chemistry and language. This course prepares students for positions in state and municipal food and hygienic laboratories, in water purification works and in sewage disposal plants.

The outline of the industrial chemistry course will be found on page 91.

Options:

(a) **Agricultural chemistry.**
(b) **Food chemistry.**
(c) **Bio-chemistry.**

CHEMISTRY.

FRESHMAN YEAR.

First Semester		Second Semester	
English Comp. (Eng. 1)	2	English Comp. (Eng. 1)	2
Public Speaking (Eng. 4)	1	Public Speaking (Eng. 4)	1
Trigonometry (Math. 2)	3	General Chem. (Chem. 1)	4
General Chem. (Chem. 1)	4	Agricultural Physics (Phys. 1a)	5
General Botany (Biol. 9)	5	Military Drill or Physical Education	1
Military Drill or Physical Education	1	Elective	4 to 6
Elective	2 or 3		
	18 or 19		17 to 19

SOPHOMORE YEAR

Expository Comp. (Eng. 2)	2	Expository Comp. (Eng. 2)	2
Quantitative Anal. (Chem. 3)	4	Quantitative Anal. (Chem. 3)	4
Invertebrate Zoology (Biol. 1)	4	Animal Physiology (Biol. 3)	5
Military Drill or Physical Education	1	Military Drill or Physical Education	1
Elective	6 or 8	Elective	5 or 7
	17 to 19		17 to 19

JUNIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Organic Chemistry (Chem. 5)	5	Advanced Organic Chemistry (Chem. 9)	4
Bacteriology (Biol. 12)	5	Sanitary Bacteriology (Biol. 16)	2
Elective	6 to 7	Organic Analysis (Chem. 4)	4
		Elective	5 to 7
	18 to 19		17 to 19

SENIOR YEAR

Industrial Chem. (Chem. 14)	5	Animal Nutrition (Chem. 11)	3
Seminar (Chem. 20)	1	Seminar (Chem. 20)	1
Organic Analysis (Chem. 4)	4	Water Analysis (Chem. 18)	4
Physical Chem. (Chem. 19)	4	Elective	9 to 11
Elective	3 to 5		
	17 to 19		17 to 19

Industrial Chemistry

This is a course in chemistry with strong required minor courses in mathematics and physics and with free electives in each year. The electives should as a rule be chosen from engineering, chemistry, biology and language. Some students may desire more mathematics and physics in which case arrangements can be made.

The course prepares students for chemistry positions in manufacturing industries. In the senior year attention will be directed to the importance of industrial chemical research and each student will work on a definite problem of importance in some industry.

Everyone confidently believes that there will be a wonderful development in manufacturing industries in Montana during the next few years. The industrial chemist will be a prominent factor in this development.

INDUSTRIAL CHEMISTRY.

FRESHMAN YEAR.

First Semester		Second Semester	
English Comp. (Eng. 1)	2	English Comp. (Eng. 1)	2
Public Speaking (Eng. 4)	1	Public Speaking (Eng. 4)	1
Algebra (Math. 1)	3	Analytical Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	General Chem. (Chem. 1)	4
General Chem. (Chem. 1)	4	Military Drill or Physical Education	1
Military Drill or Physical Education	1	Elective	5 to 6
Elective	5 to 6		
	18 or 19		18 or 19

SOPHOMORE YEAR

Calculus (Math. 4)	5	Calculus (Math. 4)	5
General Physics (Phys. 1)	3	General Physics (Phys. 1)	3
Physical Meas. (Phys. 2)	2	Physical Meas. (Phys. 2)	2
Quantitative Anal. (Chem. 3)	4	Quantitative Anal. (Chem. 3)	4
Military Drill or Physical Education	1	Military Drill or Physical Education	1
Elective	2 to 4	Elective	3 to 5
	17 to 19		17 to 19

JUNIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Organic Chemistry (Chem. 5)	5	Advanced Organic Chemistry (Chem. 9)	4
Mineralogy (Geol. 2)	3	Sound and Light (Phys. 3)	2
Electricity and Magnetism (Phys. 5)	4	Physical Meas. (Phys. 4)	2
Elective	4 to 5	Organic Analysis (Chem. 4)	4
		Elective	4 to 5
	18 to 19		18 to 19

SENIOR YEAR

Industrial Chem. (Chem. 14)	5	Industrial Chem. (Chem. 14)	5
Physical Chem. (Chem. 19)	4	Seminar (Chem. 20)	1
Seminar (Chem. 20)	1	Fuel Analysis (Chem. 17)	3
Elective	7 to 9	Elective	8 to 10
	17 to 19		17 to 19

BIOLOGY.

Professor Cooley.
Professor Swingle.
Assistant Professor Spaulding.
Assistant Professor Jennison.

While the primary object of the sub-courses in biology is to give the students a training in the sciences underlying animal industry, agronomy, horticulture and home economics, they are also well designed for purposes of education. They form a basis for an understanding of the various phases of the development of life, the problems of evolution and are an excellent preliminary to the study of social science.

The biology department now occupies the whole of the building formerly occupied by the experiment station and the agricultural departments, which has been remodeled and made more suitable for biological work. This building is 45 by 50 feet and three stories high. It contains the necessary lecture rooms, laboratories, library, collection and store rooms, and on the south side are attached two greenhouses which are used for college and experiment station work in plant physiology and pathology. In connection with the greenhouses are two large well stocked photographic dark rooms. The department is well equipped with lenses and other photographic equipment.

The library contains valuable sets of the more important books and periodicals treating of biological subjects. The department receives regularly forty-five biological periodicals and has more or less complete sets of back numbers on the shelves. Large collections of specimens and mounts in the various branches of biology are being constantly enlarged, making important adjuncts to the class and laboratory work in these subjects.

(1) **Invertebrate Zoology.** Devoted to the study of the invertebrate animals, including their morphology, development, habits, economic or popular interest and classification. The broad biological principles are brought out and emphasized. The class room work is based on Hegner's "Introduction to Zoology." The laboratory exercises include a study of the morphology of types, reference reading and practical work in the classification of animals. Required of agriculture, home economics and biology students. Lectures, 2; laboratory, 2. I., 4.

(2) **Vertebrate Zoology.** Lectures and laboratory work reviewing the vertebrate (chordate) animals, treating in detail the structure and relationships of the different groups; their classification and economic importance. Special attention is given to birds and mammals. Elective to biology and other students. Will be taught once a year either semester. Prerequisite: Biology (1). Lectures, 2; laboratory, 2. I. or II., 4.

(3) **Animal Physiology and Anatomy.** By means of lectures and demonstrations the main principles of human physiology are presented to the students, while in the laboratory they become familiar with the most important features of mammalian anatomy. Required of home economics and biology students. Prerequisite: Biology (1). Lectures, 3; laboratory 2. II., 5.

(4) **Economic Entomology.** Lectures on the anatomy, metamorphosis and classification of insects; a study of the various orders and of the principle families with particular reference to the species of economic importance; a field and insectary study of a few selected life histories; collecting, mounting and preserving insects. Required of agriculture and biology students. Prerequisite: Biology, (1). Lectures, 2; laboratory, 2. II., 4.

(5) **General and Systematic Entomology.** A consideration of the principles of classification; a more detailed study of the anatomy and physiology; development; insect adaptations; insects in relation to plants; interrelations of insects; transmission of diseases by insects. A laboratory study of the external anatomy of representatives of the more important orders; external anatomy of larvae, pupae and nymphs; classification to the family in the more important orders; identifying to the species in selected groups. Prerequisite. Biology (4). Lectures, 2; laboratory, 2. I., 4.

(6) **Advanced Economic Entomology.** A detailed consideration of the more important insect pests together with a study of the principles of insect control, including insecticides and insecticide appliances. Laboratory work on economic species and insecticides and library work on the literature of economic entomology. Prerequisite· Biology (4). Lectures, 3; laboratory, 1. II., 4.

(7) **Advanced Entomology.** Instruction in this course is largely individual and is arranged with particular reference to the needs of each student. In general the work includes one or more of the following; a systematic and biological study of a particular group; an economic study of injurious species; thesis on a selected topic; a problem; a literature search; an experiment; a life history study; anatomical study. Prerequisites: Biology (4), (5) and (6). I. and II., 6 to 10.

(8) **Household Entomology.** Lectures on insect pests of the household and a consideration of insects as carriers of common diseases. Lectures, 2. II., 2.

(9) **General Botany.** Morphology, anatomy and elementary physiology of plants, including life history studies of all the groups. The fundamental biological principles are here laid down on which all higher botanical studies are based. The last part of the semester is devoted to a brief study of the physiology of the higher plants in preparation for agricultural subjects and the classification of the families containing most of our crop plants. Required of all biology and agriculture students. Lectures, 3; laboratory, 2. I., 5.

(10) **Plant Physiology.** Lectures and experimental work on nutri-

tion, growth, reproduction and movement in plants, especially the higher forms. This is a thorough course, including the functions of plant organs in relation to plant life, adaptations of plants to their environment and behavior of plants under different kinds of treatment. Especial attention is given in the laboratory to methods most generally used in the study of plant functions. Required of biology, agronomy and horticulture students. Prerequisites: Biology (9), Physics (1a) and chemistry (5). Lectures, 1; laboratory, 3. II., 4.

(11) **Plant Pathology.** General facts and principles governing the health and disease of plants, with illustrative experiments, followed by a study of the classification, morphology, and special physiology of parasitic plants, with especial reference to diseases of cultivated crops in Montana. Required of biology, agronomy and horticulture students. Prerequisites: Biology (9) and (12). Lecture, 1; laboratory, 3. II., 4.

(12) **Bacteriology.** A study of the structure, life history and classification of bacteria, their growth in nutrient media, and methods of bacteriological technique. The relation of bacteria to agriculture, disease, and our daily life is discussed. Required of biology, agriculture and home economics students. Prerequisites: Biology (9) or (3) and chemistry (1). Lectures, 2; laboratory, 3. I., 5.

(13) **Embryology.** An introductory course in embryology, embracing a study of the foundation and growth of tissues in the vertebrate body, based chiefly on a study of the chick, but including consideration of the development in the mammalia. Open to students who have completed biology (2) or (3). Lectures, 1; laboratory, 3. I., 4.

(14) **Organic Evolution.** A lecture course treating of the different evolution theories and their present status; will also include such topics as the origin of species, heredity, variation, natural and artificial selection, adaptations, etc. Lectures and assigned reading. Required of agriculture and biology students and elective to students who have completed at least two courses in biology. Lectures, 3. II., 3.

(15) **Thesis.** Students in the biology course in their senior year and seniors from other courses, who have had sufficient previous training in biology, may devote a maximum of five credits per semester to thesis work, under the direction of Professors Cooley or Swingle, or Assistant Professor Spaulding.

(16) **Sanitary Bacteriology.** This course deals briefly with moulds and more extensively with bacteria in relation to health in the human race. It treats of infectious diseases, especially from the standpoint of their prevention. A knowledge of the sources and modes of infection for self protection and the protection of others is the central idea. Prerequisite: Biology (12). Lectures, 2. II., 2.

(17) **Systematic Botany.** This course deals strictly with classification of the flowering plants. The principles of classification are laid down in the lecture room, and laboratory and herbarium work, and field excursions serve to familiarize the student with principle orders and more important genera. Especial attention is given to the

families of greatest economic importance including the grasses. Required of biology students and elective to others. Prerequisite: Biology (9). Lectures, 1; laboratory, 3. II., 4.

CHEMISTRY.

Professor Cobleigh.
Assistant Professor Barnes.
Mr. Hytree.
Mr. Gottschalck.

The applications of chemistry to the various phases of agriculture, to engineering and to many modern industries, make this science an important one in a technical school. The fundamental courses of the science should be thoroughly taught in order that the student may have sufficient training and independence to apply his knowledge to practical operations. If the student is to master the principles of chemistry and at the same time obtain a working and practical knowledge of chemical manipulation, he must have certain facilities at his disposal.

Below is given somewhat in detail, a description of the equipment and the conveniences provided for the study of chemistry, in this institution:

The lecture room, with raised floor and seating capacity for one hundred and fifty students, has a lecture desk provided with water, gas, and electricity, a demonstration balance and stereopticon for showing the applications of the science. The class room exercises in general and applied chemistry are illustrated by experiments, lantern slides, and in many cases by exhibits of the raw materials and finished products of commercial processes. The lecture room equipment is in

There are five laboratories equipped for the following work: General chemistry, qualitative and quantitative analysis, organic and food chemistry, physical chemistry, and assaying. All desks are provided with water, gas, electricity and filter pumps when needed. The hoods in each laboratory are furnished with gas and water and connections from a large Parson's hydrogen sulphide generator, which will supply forty jets at one time. In each hood there are large steam and air baths in operation at all times, being connected to the steam heating plant. The building is well ventilated by means of a mechanical draft, and heated by a direct-indirect steam system. With some of the classes working in sections the laboratories will accommodate one hundred and fifty students.

The store room is stocked with an ample supply of apparatus and chemicals needed for the various laboratory courses. The student secures what equipment he needs from time to time, in addition to that always kept in his desk, from the storekeeper, who is on duty

at convenient and stated hours. The equipment includes, besides the usual stock of apparatus, much that is designed for special use, such as accurate balances for both quantitative analysis and assaying, standard weights, equipment for calibrating measuring apparatus, polariscopes, Abbe refractometer, oil testers, apparatus for water, air, and gas analysis, combustion furnaces, Hoskin's crucible and muffle furnaces for experiments necessitating high temperatures, apparatus for gas density determinations, Beckman's freezing and boiling point apparatus, and equipment for conductivity measurements, etc.

The department museum occupies a well lighted room in the basement. In this room are stored in cabinets, and glass exhibit cases, the collections illustrating chemical industries of various kinds, and the mineralogical and geological specimens. The mineral collection is quite extensive. It includes a valuable private collection purchased by the college some years ago. To this was added a part of the Montana mineral exhibit at Chicago in 1893, and large additions have been made from time to time through exchanges and purchases. The collection is thoroughly representative and forms an important adjunct to the chemical department.

The chemical library and office is located on the first floor and contains full sets of the American Journal of Science, Journal of the American Chemical Society, Journal of the (London) Chemical Society, Berzelius Jahresbericht, Bericht der deutschen Chemischen Gesellschaft, and Fresenius Zeitschrift fur Analytische Chemie. There are also partial sets of Chemical News and the Analyst. Besides these the library contains many standard reference works and the recent text books. There are also index volumes and card catalogues to facilitate more ready reference to the literature.

(1) **General Chemistry.** Two lectures, one recitation and two and one-half hours of laboratory work per week during the first semester on the fundamental laws of chemistry and the descriptive chemistry of the non-metallic elements. For this part of the course the class is divided into two sections.

Section I., is for students who offer units in high school chemistry for entrance to the college.

Section II., is for students who have had no instruction in chemistry in the secondary schools.

The two sections are united for the second semester for two lectures and recitations and five hours of laboratory work per week on the chemistry of the metallic elements and qualitative analysis of salts, mixtures, minerals and substances of common interest. I. and II., 8.

(3) **Quantitative Analysis.** Lectures and recitations on the theory and technique of the methods of analytical chemistry and chemical calculations. Laboratory practice in gravimetric and volumetric methods of analysis and calibration of measuring apparatus. Special

attention will be given to chemical calculations and the modern theories of solutions applied to analytical chemistry. The first semester of this course is fundamental to all other work offered in quantitative analysis and will be taught alike to all students taking the course. The second semester's work can be varied to suit the needs of various classes of students electing the course. The course is offered as an elective to students in agriculture, engineering and home economics. Prerequisite: Chemistry, (1). Lectures, 2; laboratory, 2. I. and II., 8.

(4) **Organic Analysis.** Lectures and recitations on the methods used for the analysis of organic substances and agricultural products. The laboratory portion of the course can be varied according to the requirements of the various classes of students electing the course. Assignments will be made from the following: Feeding stuffs, and cereals, sugar, milk, oils, butter, alcohol, food adulterations, soils, fertilizers, insecticides, etc. Offered as an elective to students in agriculture and home economics. Text book: Organic Analysis by Sherman. Prerequisites: Chemistry (3) and (5). Lectures, 2; laboratory, 2. I. and II., 8.

(5) **Organic Chemistry.** This is an introductory course in organic chemistry to make the students familiar with the principles of organic chemistry and the more important compounds of both the aliphatic and aromatic series. The lectures will be given to the entire class and for recitations and laboratory work the class will be sectioned. For students in agriculture and home economics, the applications of organic chemistry to the following topics will be briefly presented: composition of plants, plants as food, composition of animals, chemistry of digestion and metabolism and the chemistry of plant and animal products such as sugar, alcohol, vinegar, milk, butter, and cheese. The laboratory exercises in this section deal with agricultural materials and have been prepared by instructors in the department. Students in chemistry and chemical engineering who take this course will not emphasize in recitation and laboratory, the applications of organic chemistry, but will deal more with the science side of the subject, as a prerequisite to a more advanced course. Text: Outlines of Organic Chemistry by Moore. Prerequisite: Chemistry (1.) Lectures, 3; laboratory 1 or 2. I., 4 or 5.

(6) **Advanced Inorganic Chemistry.** Lectures and recitations on general theoretical chemistry in which special attention is given to the study of the elements according to the periodic classification of Mendeleef. Prerequisites: Chemistry (1), (3) and (5). I. and II., 6.

(7) **Agricultural Chemistry.** Lectures, recitations and laboratory exercises on the composition and reactions of soils, fertilizers, insecticides and fungicides and other materials of interest in agriculture. The laboratory work varies with the nature of the problem under study. Qualitative examinations will be made of some of the materials studied and approximate quantitative determinations will be made in cases where analytical data will be of value in illustrating principles.

The preparation of certain fertilizers and insecticides according to Peters' Laboratory Outline, will form a part of the course. Prerequisite: Chemistry, (5). Lectures, 3; laboratory, 2. II., 5.

(8) **Food Chemistry.** Lectures on the composition of foods, food production and preservation, food legislation and inspection. Laboratory exercises in detecting adulterations in foods. Prerequisite: Chemistry (5). Lectures, 2; laboratory, 1. II., 3.

(9) **Advanced Organic Chemistry.** Lectures, recitations and laboratory exercises in organic preparations of a more advanced nature than chemistry (5). Chemistry (9), is to be taken by all students who make chemistry their major subject. Prerequisite: Chemistry (3) and (5). Lectures, 2; laboratory, 2. II., 4.

(11) **Animal Nutrition.** Lectures on the functions of fats, carbohydrates, protein and salts in nutrition together with a study of the chemistry of digestion and metabolism. Prerequisite: Chemistry (5). Lectures, 2; laboratory, 1. II., 3.

(12) **Engineering Chemistry.** Lectures on the chemistry and production of lime, mortar, cement, refractory materials, iron, steel and copper. Laboratory exercises in making qualitative and approximate quantitative examinations of the materials listed above as an aid in studying their chemical properties. Text book: Industrial Chemistry by Benson. Prerequisite: Chemistry (1). Lectures, 2; laboratory, 1. I., 3.

(14) **Industrial Chemistry.** Lectures on the general operations common to many chemical industries such as crushing, grinding, calcination, fusion, distillation, filtration, crystalization, etc., and the types of machinery used in these operations. Lectures on some of the more important technical chemical processes including the following topics: Lime, mortar, cement, refractory materials, iron, steel, copper, glass, fertilizers, explosives, alkalies, acids, paint, pigments, soap, sugar, paper. The lectures are illustrated by charts, models, lantern slides and museum specimens of raw materials and finished products. Laboratory exercises are selected to supplement the class room work and are taught from the standpoint of chemical engineering. Inspections and reports on various industrial plants in the state are required in the course. Not offered in 1915-16. Prerequisites: Chemistry, (3), (4) and (5). Lectures, 3; laboratory, 2. I. and II., 10.

(17) **Fuel Analysis.** This is a course in the production and analysis of solid liquid and gaseous fuels, illuminating gas, and lubricating oils. Prerequisite: Chemistry (3). II., 3.

(18). **Water Analysis.** Lectures and laboratory practice in the chemical examination of potable waters, of water for industrial purposes and steam raising, of sewages, and of air. Lectures on water purification and softening, and sewage treatment, and also the interpretation of water analyses. Prerequisites: Chemistry (1), and first semester of Chemistry (3). I. or II., 2 or 4.

(19). **Physical Chemistry.** A course in theoretical chemistry

consisting of lectures, recitations, assigned problems, and laboratory work. The discussions include the following topics: the gas laws, thermo-dynamics, solutions, chemical mechanics, equilibrium in electrolytes, and electro-chemistry. Text book: Morgan's Physical Chemistry. Prerequisite: Chemistry (3). I., 4.

(20) **Seminar.** In order to develop in the student a habit of careful reading each student will be required to make abstracts of articles on assigned subjects from the leading journals, and present them at weekly meetings of the students and department instructors where the topics are freely discussed. Students are thus kept in touch with the progress of the science. I. and II., 2.

(21) **Thesis.** Students in the chemistry course may in the senior year prepare a graduate thesis on some subject which will involve considerable laboratory work and as much originality as possible. I. and II., 4.

GEOLOGY.

Assistant Professor Barnes.

The subjects of mineralogy and geology are important not only to the student of general science, but also to those who are specializing along some particular applied line. Here the student of agriculture gains an insight into the nature of soil as merely one particular phase of the broader subjects of rock formation, and disintegration, and from his knowledge of rocks, rock forming minerals, and the changes which these minerals undergo gains the ability to classify soils in a systematic manner. The engineer is enabled both to distinguish between the various types of rocks and minerals, and also to foresee how a given constructive material will withstand various conditions of weathering, and other destructive agents. The science student, in any field, finds in geology and mineralogy a history of the nature and origin of all the materials with which he comes in contact, and having command of such data he approaches his subject in a well prepared and intelligent manner.

The aim of the work in geology is to give the student a comprehensive view of the science as a whole. While geological processes and their results are given considerable attention other phases of the subject are not entirely neglected. Thus the course also includes a brief discussion of the principal types of rocks and rock minerals; as well as a number of the more important applications of economic geology, especially in connection with the origin of some of our more important ore bodies. The work closes with a consideration of some of the later theories in regard to the earth's formation, and a brief review of the earlier stages of the planet's history.

The department museum, containing an excellent collection of minerals, rocks, and fossils, is constantly drawn upon for illustrative material. In addition, the publications of the United States Geological

Survey are at the command of the student, and are used as references in connection with special topics. A set of lantern slides is used for illustrating many of the lectures. Besides the class room work a number of field trips are taken by the class, where the action of geological forces in the past is pointed out and studied. The college is located in an excellent region for this field study, and many interesting phases of the subject are presented close at hand. The field work is included with a one-day trip to Morrison Cave, a very interesting formation lying about fifty miles west of Bozeman.

(1) **Geology.** Lectures, recitations and assigned reading in general geology. A small amount of time will be devoted to a laboratory study of rocks and rock minerals. At least two field trips will be required of the entire class. Texts: Agricultural Students, Blackwelder and Barrows: Elementary Geology. Engineers, Ries and Watson, Engineering Geology. Prerequisite: Chemistry (1). II., 3.

(2) **Mineralogy.** Lectures and laboratory instruction in crystallography, hand specimen identification, blowpipe analysis, and determinative mineralogy. Text: Moses and Parsons' Mineralogy. Prerequisite: Chemistry, (1). I., 3 or 4.

MATHEMATICS.

Professor Tallman.
Miss Bull.

The students in this department have access to the following journals: American Journal of Mathematics (complete set); Annals of Mathematics (from 1900); Bulletin of American Mathematical Society (1898 to date); also about 200 volumes of recent treaties on mathematics. It may also be mentioned that our library is especially well equipped with treaties and journals of applied mathematics found in the libraries of the engineering and physics departments.

(1) **Algebra.** Beginning with a review of radicals and quadratic equations, the course includes progressions, arrangements and groups, binominal theorem, theory of limits, underdetermined co-efficients, logarithms and an introduction to the theory of equations. I., 3.

(2) **Plane Trigonometry.** For engineering and science students. I., 2.

(2a) **Plane Trigonometry and Logarithms.** For agricultural and home economics students. I., 3.

(3) **Analytical Geometry and Calculus.** This course includes the geometry of the straight line and conic sections coupled with the elements of differential calculus. II., 5.

(4) **Analytical Geometry and Calculus (continued).** This course which deals largely with the differential and integral calculus also takes up some problems in analytical geometry not treated in course (3), especially the geometry of three dimensions and also includes an introduction to differential equations. I. and II., 9.

(6) **Astronomy.** This course will contain the spherical trigonometry especially applied to astronomical triangle, a rather complete discussion of the subject of least squares and probable error and a rather general survey of descriptive astronomy. Prerequisite: Mathematics (4). II., 4.

(7) **Elementary Analysis.** A study of the fundamental concepts of analytical geometry and calculus of importance to students of the natural sciences and the application of the same to practical problems. I., 3.

(8) **Statistics.** Principles of the theory of probability, general methods of statistical investigation, application of the theory of probability to statistical data, fitting curves to observations, interpolation, theory of errors, mathematical theory of variation and correlation and application of the principles developed to problems in biology, sociology and economics. Prerequisites: Mathematics (4) or (7). I. and II., 6.

(10) **Differential Equations.** Ordinary and partial differential equations with geometrical and mechanical applications. I. and II., 6.

(11) **Partial Differential Equations of Mathematics-Physics.** This course will be based on Weber's "Die Partiellen Differential Gleichungen der Mathematischen Physic," and Byerley's "Spherical Harmonics." A great many applications to concrete problems will be made throughout the course. I. and II., 6.

(12) **Newtonian Potential.** Lectures on the theory of potential, with an introduction to spherical harmonics. I. and II., 4.

(13) **Algebra (Advanced).** This course will be an extension of course (1), and will contain discussion of complex numbers, theory of algebraic functions, etc. Care will be taken to show the practical application of each subject as the work advances; that is, such subjects as the connection between complex numbers and alternating currents, etc., will be fully explained. I. and II., 6.

(14) **Analytical Geometry (Advanced).** This course is a continuation of course (4). As the time given in course (4) for geometry of three dimensions is very limited it will receive considerable attention in this course. I. and II., 6.

(15) **Thesis.** Students specializing in mathematics are required to present a thesis on some chosen subject. This subject must be chosen and approved not later than November 15 of the senior year. A great deal of work in this line is desired, as it is believed there is no better way of developing a habit of independent thought.

Only a selection of courses (10) to (14) will be given each year, those being chosen for which most students apply. The special object of our work here is to make the course in applied mathematics complete, and the work in pure mathematics will have as its object the laying of a good foundation for the more advanced work in applied mathematics. Those desiring to do work which is not offered in the above courses may consult the professor in charge of the department.

PHYSICS.

Professor Ham
Mr. Kiefer.

The following courses in physics are designed to meet the needs of (1) those students who are preparing to take up some of the more technical studies in engineering or agriculture, (2) those who expect to become physics or science teachers, and (3) those general science students who wish to acquire some of that kind of scientific training which is peculiar to the science of physics alone.

The facilities at the disposal of the physics department are described below somewhat in detail.

The lecture room is located in the basement of the chemistry and physics building. The lecture desk is supplied with gas and both alternating and direct current circuits. A projection lantern is permanently set up and is used constantly to illustrate the class room exercises. A large collection of lantern slides has been prepared which cover the whole subject of physics. The apparatus for lecture demonstration has been carefully selected and is sufficiently complete for giving experimental illustrations of all the principles of the science that are usually included in college courses.

For laboratory instruction three well lighted and conveniently furnished rooms are provided on the second floor of the building.

One of these rooms is equipped for electrical measurements and is wired with both alternating and direct current circuits, conveniently arranged for experimental purposes. The galvanometers are permanently located in convenient positions. The following forms are available: Tangent, astatic, Thompson, differential, Northrup, and eight forms of the D'Arsonval type, including three with ballistic suspensions. In addition to the above equipment the following instruments are used in the various experiments taught, viz: magnetometer, standard resistance and condenser, an air condenser for determining the ratio of the electrostatic to the electromagnetic units, Cahart-Clark cells, wire and box forms of the Wheatstone bridge, Carey Foster bridge, Callendar and Griffith's bridge, rheometer, electro-dynamometer, ammeters, voltmeters, Leed's potentiometer, platinum thermometer thermocouples, earth inductor, standard solenoid, Thompson integrating wattmeter and a permeameter with ten different specimens of iron for experiments in magnetization and hysteresis.

The second laboratory is furnished and equipped for teaching mechanics and heat. The equipment includes the following: micrometer and vernier gauges, spherometer, cathetometer, balances and weights, hydrometers, Atwood's machine, Young's modulus apparatus, torsion apparatus, torsion pendulums, apparatus for resolution and composition of forces, impact, harmonic motion, principle of moments, centrifugal force, and surface tension; simple and Kater's pendulums, a laboratory

clock, thermometers, air thermometer, calorimeters, expansion apparatus, hygrometers, Searle's mechanical equivalent of heat apparatus.

The third laboratory is used for the study of light and sound and also for the elementary classes in the preparatory school. The equipment for teaching light and sound includes the following: a photometer, spectrometer, spectroscope, mirrors, prisms, lenses, diffraction gratings, optical bench, Fresnel mirror and bi-prism, apparatus for polarized light, microscope, telescope and an Abbe refractometer, sonometers, Kundt's tubes, siren, Lissajous apparatus, and Helmholtz resonators.

For the study of radioactivity and allied phenomena, there is a large induction coil, a variety of Crookes' and X-ray tubes, Wilson electroscope, radium compounds and other radio-active material.

The physics library is located in one of the laboratories for student's use. It contains many of the best books and general works on physics, and the current numbers of the Philosophical Magazine, the Physical Review, Science Abstracts, Section A, Bulletins of the Bureau of Standards, and School Science and Mathematics.

(1a) **Agricultural Physics.** Lectures and laboratory work in mechanics, heat, light and electricity. Special attention is given in this course to the study of such physical principles as those involved in the capillary action of soils, the osmetic action of plants, the movements of winds and moisture, the causes of the deposition of dew and the prevention of frost. Physics (1a) is prescribed in the courses in agriculture and biology. Text books: General Physics, by Crew; Laboratory Course, by Sabine; Laboratory Physics, by Miller. Prerequisites Mathematics (2) or (2a), and Physics (2) or its equivalent. Lectures, 3; laboratory, 2. II., 5.

(1) **Engineering Physics.** Lectures, recitations, and assigned problems, three hours per week throughout the year on mechanics, heat, magnetism, and electricity. This course is more mathematical and technical than physics (1a) and is particularly designed to meet the needs of students in engineering. Students who have not completed the calculus, mathematics (4), are required to take it during the same year that physics (1) is taken. Text book: General Physics, by Hastings and Beach. I. and II., 6.

(2) **Physical Measurements.** A laboratory course designed to supplement physics (1). It is strictly quantitative and is given for the purpose of providing laboratory illustrations of fundamental principles of the science and to offer a training in making measurements of precision. Text books: Mechanics, Molecular Physics and Heat, by Millikan; Laboratory Physics, by Miller. I. and II., 4.

(3) **Light and Sound.** Lectures and recitations two hours per week on wave motion, the theory of light in its application to familiar optical phenomena and to optical instruments, and on the phenomena and laws of sound. Text book: Light and Sound, by Franklin & McNutt. Prerequisites: Physics (1) and (2). II., 2.

(4) **Physical Measurements.** A laboratory course in light and sound to supplement physics (3). II., 2.

(5) **Electricity and Magnetism.** Two lectures and two laboratory periods per week on methods for the exact measurements of resistance, electromotive force, current, capacity, and the coefficient of self-induction. The calibration of commercial instruments, insulation testing, and magnetic measurements, such as finding the permeability and the hysteresis effects of different samples of iron, will also be included in this course. Prerequisites: Physics (1) and (2) and differential and integral calculus. I., 4.

(6d) **Pedagogy of Physics.** This course will be modified from year to year to suit the needs of the individual student. In general the course will include discussions of the methods of teaching, the selection and performance of effective lecture table and laboratory exeprimients and practice in presenting the topics covering such experiments to elementary and college classes. Prerequisites: Physics (1), (2), (3) and (4). I. or II., 3.

(9) **Household Physics.** This course is offered to students in the home economics course and to women in the other college courses who desire a better knowledge of the physics that is used in many of the household operations. Special attention will be given in this course to the physics of ventilation, the lighting and heating of houses, the principles of electric, gas, and water meters, etc. Two lectures and one laboratory. I., 3.

(10) **Meteorology.** This course is offered as an elective, particularly, to agricultural students who have had physics (1a) but is open to all who have had one course in college physics.

Topics such as air temperature, air pressure, winds, water vapor and its movement in the air, precipitation and its measurement, and a study of Montana weather conditions by means of weather bulletins will be made a part of this course. I., 3.

(11) **Electron Theory.** This is primarily a graduate course of lectures but will be open to undergraduates who can satisfy the prerequisites. The course will not be a survey course but will take up some line of recent research work and investigate this in detail. Prerequisites: Calculus and at least fourteen credits of college physics. A knowledge of the methods of solution of some of the simpler differential equations and a reading knowledge of German are also desirable. II., 2.

College of Industrial Arts

Three separate courses leading to the degree of Bachelor of Science, are offered in the College of Industrial Arts. They are home economics, applied art and secretarial work. There are also two-year courses in this college not leading to a degree; one in applied art and one in secretarial work. The entrance requirements are the same as for the four-year courses and a certificate is granted upon the completion of either course. A detailed statement of the purpose and scope of each course may be found on the page preceding the tabulation of the course. The purpose of each is indicated by its title and the industrial application of the work is emphasized in each course. The applied art coursea nd secretarial work are open euqally for men and women.

Several subjects taught in departments not represented in the college of industrial arts are open to election by students on consent of their advisers. Among these may be mentioned music (limited to four credits for any one person), and such subjects in the college of agriculture and engineering and applied science as the applicant may be qualified for and as the schedule permits.

Home Economics

The object of this course is two-fold. First, to give young women a liberal education with a scientific basis, and to train them along lines pertaining to science, management and care of the home. Second, to give training to those who wish to become teachers of home economics, or dietitians. This course gives an opportunity for the correlation of arts and sciences with home economics.

In the junior and senior years there is considerable opportunity for electives which must be chosen by the advice and with the approval of the class officer. A choice is given in the first semester of the junior year, between history and physics, and nutrition the second semester; art and chemistry. If chemistry is elected art will be required in the senior year. Electives in the junior and senior years include art, music, millinery, and horticulture. In the senior year biology, chemistry, advanced food studies, history, French and English are electives.

Students expecting to teach will take home economics courses (8) and (15). Other students may substitute work approved by the class officer. Those expecting to do graduate work in home economics or to teach in high schools are advised to take physics (9), chemistry (11), and history (10).

*Work of an advanced type will be given to freshmen having home economics credits in cooking and sewing.

HOME ECONOMICS

FRESHMAN YEAR

First Semester		Second Semester	
English Comp. (Eng. 1)	2	English Comp. (Eng. 1)	2
Public Speaking (Eng. 4)	1	Public Speaking (Eng. 4)	1
German (10) or (12) or French (1)	4	German (10) or (12) or French (1)	4
History (7) or	4	Principles of Cookery (H. E. 1)	4
Trig. (Math. (2a)	3	General Chem. (Chem. 1)	4
General Chem. (Chem. 1)	4	Art (Art 7)	2
*Sewing (H. E. 11)	3	Physical Education	1
Physical Education	1		
	18 or 19		18

SOPHOMORE YEAR

Expository Comp. (Eng. 2)	2	Expository Comp. (Eng. 2)	2
German (11) or (13) or French (1) or (2)	4	German (11) or (13) or French (1) or (2)	4
Organic Chem. (Chem. 5)	4	Food Chemistry (Chem. 8)	3
Invertebrate Zoology (Biol. 1)	4	Food Studies (H. E. 2)	4
Dressmaking (H. E. 12)	2	Animal Physiology (Biol. 3)	5
Household Arch. (H. E. 3)	2	Physical Education	1
Physical Education	1		
	19		19

JUNIOR YEAR

Economics (Econ. 3)	2	Sanitation (Biol. 16)	2
Bacteriology (Biol. 12)	5	Textiles (H. E. 13)	2
Textiles (H. E. 13)	2	Economics (Econ. 3)	2
Advanced Cookery (H. E. 4)	2	Dressmaking (H. E. 14)	3
History (5) or (10) —or—	3	Costume Design (Art 8) or	2
Household Physics (Phys. 9)		Quantitative Chem. (Chem. 3)	4
Household Decoration (Art 8b) —or—	2	Household management (H.E. 7)	3
Quantitative Chem. (Chem. 3)	4	History (5) or (10) —or—	3
Electives	1 to 3	Animal Nutrition (Chem. 11)	
		Electives	0 or 2
	17 to 19		17 or 19

SENIOR YEAR

Psychology (Phil. 1)	3	Sociology (Econ. 4)	3
History of Home Econ. (H.E. 9)	2	Teaching Domestic Science (H. E. 8)	3
Dietetics (H. E. 6)	4	Teaching Dom. Art (H.E. 15)	2
Embroidery (H. E. 16)	2	Home Problems (H. E. 10)	3 to 5
Electives	5 to 8	Electives	5 to 8
	16 to 19		16 to 19

Applied Arts

That the study of drawing is important in education is now universally acknowledged. Aside from the advantage to engineers, machinists, and architects of practical knowledge of draughtsmanship, the psychologic value of a knowledge of drawing is very great. The chief object of education is in the quickening of the powers of the mind. Drawing brings out the power of analysis, habits of observation, qualities of judgment, imagination, memory and taste. It is something more than mere training of the eye. To achieve even moderate success requires that thought be put into every line.

Art, aside from anything we can produce, helps us to appreciate the work of great artists and opens our eyes to the beauty of form and color in nature. It extends our powers of enjoyment and gives us a better understanding of the history of the human spirit. It gives a proper gratitude for the work of the great artists.

With the coming of the applied arts movement, has come the demand for work in manual training directly related to, and based upon art principles. With this purpose in view courses are offered in artistic handicraft, jewelry, hammered metal, pottery and leather work with all the facilities and equipment needed for artistic and practical work.

The art course, as here outlined, will indicate the work of the average student in a four year's course planned for those who attend mainly for art work. The student is carried forward just as rapidly as his own talent and industry will permit.

The course offers thorough training in the study of form, color, ornament, historic art, principles of design and composition and in technical methods in applied design. It insures a broad foundation of art culture and skill which will enable students to make practical use of their training. The theory of design is presented as fundamental to the crafts. Exceptional facilities are offered for the study of design and composition and the course is strengthened by the many phases of related art work. Every effort is made to teach drawing. The pupil is then encouraged to follow any line of art work for which he seems best fitted. Applied design, interior decoration, handicraft work or teaching.

Attention is called to the regulation printed on page 25 regarding work done suitable for exhibition purposes.

APPLIED ART.

FRESHMAN YEAR.

First Semester		Second Semester	
English Comp. (Eng. 1)	2	English Comp. (Eng. 1)	2
German (10) or (12) or French (1)	4	German (10) or (12) or French (1)	4
Public Speaking (Eng. 4)	1	Public Speaking (Eng. 4)	1
General Botany (Biol. 9)	5	Cooking (H. E. 1)	4
Drawing (Art 1)	2	Physiology (Biol. 3)	5
Sewing (H. E. 11)	3	Design (Art 7)	2
Physical Education	1	Physical Education	1
	18		19

SOPHOMORE YEAR

English Literature (Eng. 10)	2	English Literature (Eng. 10)	2
German (10) or (13) or French (2)	4	German (11) or (13) or French (2)	4
History of Art (Art 6)	2	History of Art (Art 6)	2
Drawing (Art 1a)	3	Drawing (Art 1a)	3
Design (Art 7a)	2	Design (Art. 7a)	2
Water Color (Art 2)	2	Water Color (Art 2)	2
Handicraft (10-11-12 or 13)	2	Handicraft (10-11-12 or 13)	2
Physical Education	1	Physical Education	1
	18		18

JUNIOR YEAR

Interpretive Reading (Eng. 6)	2	Interpretive Reading (Eng. 6)	2
Household Physics (Phys. 9)	3	Advanced Design (Art 7b)	3
Medieval History (Hist. 2)	3	Medieval History (Hist. 2)	3
Drawing (Art. 1b)	2	Drawing (Art 1b)	2
Water Color (Art 2a)	2	Water Color (Art 2a)	2
Handicraft (10-11-12-13)	2	Handicraft (10-11-12-13)	2
Elective	4	Elective	4
	18		18

SENIOR YEAR

Psychology (Phil. 1)	3	Sociology (Econ. 4)	3
Methods (Art 18a)	2	Methods (Art 18b)	2
Thesis	4	Thesis	4
Elective	8 or 9	Elective	8 or 9
	17 or 18		17 or 18

Two-Year Art Course

The two-year course is offered to meet the needs of those students who have marked ability and who wish to specialize in art with a view to teaching the subject in public schools.

The entrance requirements are the same as for the four-years course and a certificate is granted upon the completion of the course.

TWO-YEAR ART COURSE

Design and Handicraft.

FIRST YEAR.

First Semester		Second Semester	
English Comp. (Eng. 1)	2	English Comp. (Eng. 1)	2
Public Speaking (Eng. 4)	1	Public Speaking (Eng. 4)	1
Drawing (Art 1)	2	Drawing (Art 1)	2
Perspective (Art 15)	2	Composition (Art 16)	2
Art History (Art 6)	2	Art History (Art 6)	2
Design (Art 7)	2	Design (Art 7)	2
Handicraft (10-11-12-13)	4	Handicraft (10-11-12-13)	4
Physical Education	1	Physical Education	1
Elective	2	Elective	2
	18		18

SECOND YEAR.

English Literature (Eng. 10)	2	English Literature (Eng. 10)	2
Water Color (Art. 2)	2	Water Color (Art 2)	2
Methods (Art 18a)	2	Methods (Art 18b)	2
Psychology (Phil. 1)	3	Design (Art 7)	2
Design (Art 7)	2	Handicraft (10-11-12-13)	2
Handicraft (10-11-12-13)	2	Practice Work (Art 17)	2
Practice Work (Art 17)	2	Physical Education	1
Physical Education	1	Elective	2 to 5
Elective	2		
	19		16 to 19

Secretarial Course

This is a college course requiring fifteen units of preparation for admission, and extends through four years of study. This not a university course in commerce but a vocational course which prepares for specific kinds of work. There is a demand for young people with more advanced training than the commercial course in the high school. The secretarial course is intended to prepare for such positions as private secretary, office assistant, association secretary and institutional manager.

The course consists in a thorough grounding in English and modern foreign language, together with some home economics, science, history and social science. The technical work includes shorthand, typewriting, business methods, office practice and the principles of accounting. The freshman year is nearly the same as the freshman year in home economics and applied art. The choice may be delayed until the beginning of the sophomore year.

SECRETARIAL COURSE.

FRESHMAN YEAR.

First Semester		Second Semester	
English Comp. (Eng. 1)	2	English Comp. (Eng. 1)	2
Public Speaking (Eng. 4)	1	Public Speaking (Eng. 4)	1
German (10)or(12); French (1); Spanish (20)	4	German (10)or(12); French(1); Spanish (20)	4
English History (Hist 1)	3	English History (Hist. 1)	3
Chemistry (Chem. 1)	4	Chemistry (Chem. 1)	4
*Sewing (H. E. 11)	3	Business Correspondence(Sec.5)	3
Physical Education	1	Physical Education	1
	18		18

SOPHOMORE YEAR

Expository Comp. (Eng. 2)	2	Expository Comp. (Eng. 2)	2
German (11) or (13); French (2)	4	German (11) or (13); French (2)	4
**History (Hist. 5 or 10)	3	History (Hist. 5 or 10)	3
Shorthand (Sec. 1)	4	Shorthand (Sec. 1)	4
Typewriting (Sec. 3)	4	Typewriting (Sec. 3)	4
Physical Education	1	Physical Education	1
	18		18

JUNIOR YEAR

English Literature (Eng. 10)	2	English Literature (Eng. 10)	2
Office Practice (Sec. 6)	4	Business Methods (Sec. 7)	4
Shorthand (Sec. 2)	3	Shorthand (Sec. 2)	3
Typewriting (Sec. 4)	3	Typewriting (Sec. 4)	3
Elective	6	Commercial Law (Sec. 8)	3
		Elective	3
	18		18

SENIOR YEAR

Economics (Econ. 3)	2	Economics (Econ 3)	2
Psychology (Phil. 1)	3	Sociology (Econ. 4)	3
Accounting (Sec. 9)	3	Accounting (Sec. 9)	3
Shorthand (Sec. 11)	2	Shorthand (Sec. 11)	2
Typewriting (Sec. 12)	2	Typewriting (Sec. 12)	2
Elective	4 to 6	Elective	4 to 6
	16 to 18		16 to 18

*Men will elect another subject.

**Only one of these courses will be given in the sophomore year.

Two-Year Secretarial Course

The two-year secretarial course is intended for those students who cannot remain to complete a four-year course. The completion of a high school course or its equivalent is required for entrance. The practical courses in shorthand, typewriting, etc., are the same as in the long course, but the foreign language, chemistry, economics and part of the history is omitted. Those who complete this course satisfactorily will be granted diplomas but no degree, and will be prepared to do secretarial and office work.

TWO-YEAR SECRETARIAL COURSE

FIRST YEAR

First Semester		Second Semester	
English Comp. (Eng. 1)	2	English Comp. (Eng. 1)	2
Shorthand (Sec. 1)	4	Shorthand (Sec. 1)	4
Typewriting (Sec. 3)	4	Typewriting (Sec. 3)	4
*Sewing (H. E. 11)	3	Business Correspondence (Sec. 5)	3
Office Practice (Sec. 6)	4	Business Methods (Sec. 7)	4
Physical Education	1	Physical Education	1
	18		18

SECOND YEAR.

Expository Comp. (Eng. 2)	2	Expository Comp. (Eng. 2)	2
History (Hist. 1)	3	History (Hist. 1)	3
Shorthand (Sec. 2)	3	Shorthand (Sec. 2)	3
Typewriting (Sec. 4)	3	Typewriting (Sec. 4)	3
Accounting (Sec. 9)	3	Accounting (Sec. 9)	3
Elective	3	Elective	3
Physical Education	1	Physical Education	1
	18		18

*Men will elect another subject.

APPLIED ART.

Assistant Professor Lana A. Baldwin.
Miss Genevieve Lane.

The art department occupies the entire north front of the second floor in Montana Hall. The studios are large and well lighted.

The department has a very complete and carefully selected collection of casts from the antique, including full length casts of the Venus de Milo, Borghese Warrior and the Winged Victory.

The equipment for work in the handicrafts includes work benches and full sets of tools for each individual student electing work in metalry and jewelry, potter's wheels for throwing and casting pottery and a china kiln of the largest size for firing china.

There is a fine collection of works on art in the library suitable for class reading and serious study, also photographs from foreign countries and reproductions of celebrated pictures.

(1) **Freehand Drawing.** Drawing from the cast in charcoal, pencil, or pen and ink. I., 2.

(1a) **Freehand Drawing.** Continuation of Art (1). I. and II., 6.

(1b) **Freehand Drawing.—Continuation of Art (1). I. and II., 4.**

(2) **Water Color.** Work from nature and still life. Prerequisite: Art (1). I. and II., 4.

(2a) **Water Color.** Continuation of Art (2). I. and II., 4.

(3) **Architectural Drawing.** Drawing from still life and casts. Study of architectural details, and sketching from nature. Work executed in pencil, pen and ink, and charcoal. II., 2.

(3a) **Freehand Drawing.** Advanced work in drawing, including problems in composition and design. Work executed in pencil, charcoal, wash and color. Prerequisite: Art (3); Laboratory, 4. I., 2; II., 2.

(4) **Drawing from Nature.** In pencil, pen and ink, wash and color. This is intended especially for students in biology. II., 2.

(5) **Clay Modeling.** Decorative work from original designs, given in connection with study of historic ornament and design. I. or II., 2.

(6) **History of Art.** This work is intended especially for students in design. Particular attention is given to the study of historic ornament and the classic styles as exemplified in painting, sculpture and architecture. I. and II., 4.

(7) **Design.** Study of applied design and incidentally the use of water colors. Students submit original designs. II., 2.

(7a) **Historic Ornament.** A study of historic ornament with analysis of historic examples of design. Original problems executed in black and white and in color. Prerequisite: Art (7). I. and II., 4.

(7b) **Advanced Design.** Original designs for commercial purposes executed to meet the requirements and conditions of reproduction. I. and II., 4.

(8) **Costume Design.** The study of color and design as applied to

dress. History of costume. This course is made as practical and helpful as possible. Students prepare original designs. II., 2.

(8a) **Embroidery Design.** Students study theory of color and design and submit original designs of embroidery. Work rendered in black and white and in color. II., 2.

(8b) **Household Decoration.** Study of color, line and form as applied to house furnishings. Students are given practical problems to demonstrate these theories. Lecture, 1; laboratory, 1. I., 2.

(8c) **Decorative Periods.** Advanced work in interior decoration. A study of decorative styles and their adaptation to modern uses. Original designs for interiors executed in color. Prerequisite: Art (8b). I. and II., 4.

(9) **China Design.** Study of applied design for decoration of china. This includes study of color. I. and II., 4.

(10) **Painting on China.** Students to be admitted to the classes in china painting must satisfy the instructor that they have the necessary preparation to undertake the work profitably. China is fired in the studio. I. and II., 4.

(11) **Leather.** Tooling, modeling and embossing; also use of dyes and stains for leather. Prerequisite: Art. (7). I. and II., 4.

(12) **Jewelry.** Making of simple and unique jewelry in silver and in copper. This includes saw-piercing, enameling, repousse and the setting of semi-precious stones. Prerequisite: Art (7). I. and II., 4.

(13) **Metal.** Work in copper, brass and silver. This course includes raising, saw-piercing, etching, hard and soft soldering and riveting. Prerequisite: Art (7). I. or II., 4.

(14) **Basketry.** The making of baskets of reeds and raffia and other suitable materials. Study of dyes and dying baskets. Use of native materials in original work in basketry. II., 1.

(15) **Perspective.** The principles of angular and parallel view perspective taught by means of freehand sketches and drawings. Work executed in pencil, pen and ink, wash and color. Lecture, 1; laboratory, 1. I., 2.

(16) **Composition.** A study of art structure as a means of expression. Students submit original compositions in light and dark, line and color. Lecture, 1; laboratory, 1. II., 2.

(17) **Practice Work in Teaching.** Teaching drawing, painting, design and handicrafts. I. and II., 4.

(18a) **Methods.** Methods of teaching drawing, painting and design. Lesson plans and materials. I., 2.

(18b) **Methods.** Methods of teaching the handicrafts; metal, jewelry, leather, basketry, wood block painting and stenciling. Lesson plans. Materials and equipment. II., 2.

ENGLISH.

Professor Brewer.
Dean Herrick.
Assistant Professor Gilruth.
Miss Brown.

The library has abundant equipment for all the work offered in English. There are complete standard texts of practically all the authors referred to in any of the courses. Besides these there is a fair supply of biographical, critical and historical works, sufficient for ordinary reference use. The library equipment is complete enough so that thus far students have been able to do the reading assigned without the necessity of purchasing many books.

Though many classic novels are to be found on the shelves, no effort has been made in the college library to provide current fiction.

In all the courses in English, written work plays an important part. That this work may be kept up to the proper grade, it is announced here that in college English work no paper will receive any credit that shows notable carelessness or ignorance in elementary matters of punctuation, grammar, rhetoric, or in the spelling of common words.

(1) **English Composition.** The course is required of all freshmen. The course is almost altogether practice in various types of prose composition; narration, description, exposition, criticism, and argumentation. The class meets ordinarily twice a week. The instructor from time to time meets each student for private conference about his work. Lectures. I. and II., 4. Mr. Gilruth.

(2) **Expository Composition.** This is a course primarily in expository writing and intended for students who will go into scientific or technical work. Papers prepared in scientific or technical courses, if not too technical, may be handed in as part of the work of this course. The year's work may also include some practice in business correspondence and in argumentative writing in preparation for English (5). I. and II., 4. Prof. Brewer.

(4) **Public Speaking.** Informal lectures. Extemporaneous speaking and training in the writing of the different forms of public discourse. The course will close with a study of the essential principles of debating; each student will be required to take part in at least one debate. Required of all freshmen. I. and II., 2. Mr. Gilruth.

(5) **Argumentation and Debating.** Study of the principles of argumentation and master pieces of forensic oratory. Preparation of briefs and forensics. Conferences, lectures, debates and other forms of public address. Elective for seniors and juniors who have credit for courses (1), (2) and (4). I. and II., 4. Mr. Gilruth.

(6) **Interpretive Reading.** This course will include work in the cultivation of the voice and the study of gesture, together with a large

amount of drill in interpretive reading from standard literature, both prose and poetry, and especially in oratory and the drama. It is intended for those who expect to take part in oratorical or declamatory contests, and in college plays. It is elective for sophomores, juniors and seniors. Prerequisites: English (1) and English (4). With the consent of the instructor, it may be taken in the first half-year separately. I. and II., 4. Mrs. Herrick.

(10) **English Literature.** A reading course in English literature including about twenty of the more important authors. A large amount of reading is required and more recommended. Written reports on the reading are frequently required. A part of the class room time is given to critical reading of English masterpieces. Lectures, recitations, and conferences. I. and II., 4. Prof. Brewer.

(11) **English Essayists of the Nineteenth Century.** A study of the more important essayists from Charles Lamb to R. L. Stevenson. Lectures and recitations. I. and II., 4. Prof. Brewer.

(12) **Shakespeare.** A careful reading of three plays in the class room, and outside reading in other plays of the period. Lectures and recitations. II., 4. Prof. Brewer.

(13) **Victorian Poetry.** A study of the poetry of the Victorian period, with special reference to the work of Alfred Tennyson, Robert Browning, and Matthew Arnold. Lectures and recitations. I. and II., 4. Prof. Brewer.

Course 10 is given every year and is prerequisite to courses 11-13. Courses 11-13 are not all given in the same year. Classes will be organized when a sufficient number of students elect any course.

FRENCH AND SPANISH.

Miss Wallin.

(1) **French.** First year's work includes elements of grammar based on Fraser and Squairs' French Grammar, with constant practice in pronunciation, dictation, and conversation. Reading of easy texts. I. and II., 8.

(2) **French.** Review of grammar. Typical fiction and dramas of the nineteenth century are studied. Advanced composition and original theme writing. Conversation and dictation. I. and II., 8.

(3) **French.** Study of classic French literature of the seventeenth and eighteenth centuries, such as Corneille, Racine, Moliere, LeSage and Voltaire. Collateral reading and reports. Lyric poetry. I. and II., 6 or 8.

(20) **Spanish.** The work of the first year consists of the elements of grammar with conversation and special emphasis on pronunciation. Reading of such modern authors as Valera, Alarcon, Galdos and Moratin.

GERMAN.

Assistant Professor Cehrs.
Miss Ailinger.

(10) **German.** This course is open to college students who have not had high school or preparatory German. The work of the first year includes pronunciation, grammar, selections in prose and verse, with practice in speaking and writing German. I. and II., 8.

(11) **German.** A continuation of the above course. The work consists of reading of texts suitable for second year work; for the most part, the writings of contemporary authors. Memorizing of easy colloquial sentences and poems. Conversation and composition. An effort is made to familiarize the student with the customs, life and spirit of the German people. I. and 11., 8.

(12) **German.** This course, open to freshmen, is a continuation of the course offered in the preparatory department, and can be taken only by students who have had two years of German previously. The classics will be studied; also scientific texts if desired. Conversation and composition. I. and II., 8.

(13) **German.** An elective course offered to those who have completed course (11) and (12). It consists chiefly of advanced reading of a practical, scientific or literary character, as the needs of the students electing it may dictate. I. and II., 8.

HISTORY.

Assistant Professor Brewer.
Mr. Romney.

The department has a set of MacCoun's historical charts of the United States and two sets of historical geography charts of Europe by the same author; Johnston's series of maps of ancient geography; ten of Breitschneider's maps of medieval Europe; and a set of maps of the modern world.

The library contains the laboratory of the historical department, but a catalogue of the histories would be too voluminous to include here. In Greek and Roman history, besides the standard narrative works, there are translations of the best source material for this period. For English history the library is well equipped with general works and has source material including Colby, Lee and the University of Pennsylvania collection, Evelyn's Diary, a file of "The Gentleman's Magazine," etc.

Naturally the works on the United States history are the most numerous. The standard general histories, as well as works on limited periods or regions, and the best biographies of American statesmen, are in the library. The reports of the American Historical asso-

ciation, and the Congressional Records, come to the library. There are also many contemporary records, among which are the Old South Leaflets, Hart's American History Told by Contemporaries; the complete works of Jefferson, Hamilton and other statesmen, and the Jesuit Relations.

The works on industrial history are more recent; and works on the development of our own industrial and commercial life are constantly being added to the equipment of the department.

A reflectoscope is installed in the class room, which is at all times available for showing pictures of historic scenes and objects. A large number of views belonging to the teacher are used in all classes.

(1) **English History.** It is taken for granted that the student has had a preparatory course in general history, with some such text as Myers or West. In this course study of the text book is supplemented by lectures on the English constitution and on the development of continental Europe. Special topics emphasizing industrial and social development, with library references are assigned to the student in addition to the text. I. and II., 6.

(2) **Medieval History.** The student is supposed to have had courses which have given him knowledge of the great epochs in history and their relation to each other. Therefore, in this course he will take up the thorough history of one period. In this connection the student has an opportunity to study the art development of the period. He will be encouraged to form his own opinions by the use of such historical sources of this period as are available. I. and II., 6. Renaissance in Italy (1915-16.)

(5) **American History.** This is a course in United States history covering the period of constitutional development and with special reference to that development. The use of the library rather than of any text book is required in this course, and the student is expected to spend about one-fourth of the time in the preparation of a paper on some selected subject. Course (1) should precede this course. I. and II., 6.

(7) **Modern History.** A short course in recent history will be offered to freshmen. The object will be to give them a more intelligent interest in current events by a review of the political and industrial development of the last few decades. I., 4.

(10) **Industrial History.** English history (1) and knowledge of the outlines of United States political history is required for this course. A text book on Industrial History of the United States is used as the basis for work. Each semester the student will write a paper on some special line of industry which he either reads upon or personally investigates. Lectures on related subjects will supplement the student's work. I. and II., 6.

HOME ECONOMICS.

Professor Harkins.
Assistant Professor Ballinger.
Miss Ford.
Mrs. Martin.
Miss Smith.

The home economics department occupies the third floor of the agricultural building. Two large cooking laboratories are equipped, one with gas, the other with electricity, and are fitted very completely with all necessary cooking utensils. In addition to these there are balances, thermometers, hydrometers, microscopes and other equipment for the carrying on of scientific work. A large, well equipped dining room opening from one of the cooking laboratries, affords ample opportunity for experience in the serving of meals either for small families or for large groups.

The classes in sewing occupy two large well lighted rooms with ample provision for fitting. The equipment consists of large cutting tables, individual work tables, sewing machines of various makes, an electric motor, electric irons, dress forms, loom, work cases, and cases for exhibition material. The department possesses several very interesting and instructive textile exhibits and various old hand apparatus which shows the development of textile industry.

(1) **Principles of Cookery.** This work includes both lecture and laboratory work on the composition and preparation of foods. Lectures on marketing and care of food materials. The object of the course is to teach plain cooking based upon scientific principles. More advanced work is given to students who have had high school courses in cooking. Lecture, 1; laboratory, 3. II., 4. Miss Harkins.

(2) **Food Studies.** This course is designed to make practical application of the science underlying the selection and preparation of foods. The dishes prepared illustrate the scientific principles involved. Prerequisites: H. E. (1); Chem. (1) and (5). Lectures, 2; laboratory, 2. II., 4. Miss Ford.

(3) **Home Architecture and Sanitation.** Evolution of the home, modern houses; site, surroundings, construction, heating, ventilating, lighting, water supply, plumbing and drainage. Practice in drawing floor plans of houses. Lectures on the history of furniture, floor coverings and wall hangings, economic problems in house furnishings. I., 2. Miss Harkins.

(4) **Advanced Cooking.** In this course menus are planned and meals prepared. The student has instruction in the making of a few difficult and fancy dishes. Prerequisites: H. E. (1) and (2). Laboratory, 2. I., 2.

(5) **Advanced Food Studies.** This course continues the work outlined in home economics (2), taking up a more detailed study of

the food principles and correlating closely with the work in bacteriology, physics, chemistry, biology and physiology. Prerequisites: H. E. (6); Chem. (11); Biol. (12); Physics (9). I., 2. Miss Harkins.

(6) **Dietetics.** This course treats of the fundamental principles of human nutrition and metabolism, the relation of food to health and disease, and the construction and preparation of dietaries. Prerequisites: H. E. (2); Chem. (5); Biol. (12). Lectures, 2; laboratory 2. I., 4. Miss Ford.

(7) **Household Management.** Organization of the household; expenditure of income; education for the home; household accounting; care of the house and other essentials of a well ordered home. Lectures on home nursing by a trained nurse. Lectures, 2; laboratory, 1. II., 3. Miss Harkins.

(8) **Teachers' Course.** In this course both the theory and practice of teaching domestic science is given. A study is made of the courses of study in various institutions. Courses of study are planned for graded schools, high schools, and colleges. Each student has work in practice teaching. Prerequisites: Home Economics (3), (4), (5), (6) and (7). Lectures, 2; laboratory, 1. II., 3. Miss Harkins.

(9) **History of Home Economics.** A brief survey of woman's education; origin and development of home economics; the work in different types of schools. II., 2. Miss Harkins.

(10) **Home Problems and Demonstrations.** In this course, which is individual work, the student is given an opportunity to carry on original or suggested investigation in food work, or along economic lines pertaining to some phase of the home. Open to seniors only. II., 3 or 5. Miss Ford.

(11) **Elementary Clothing** deals with the fundamental principles of hand and machine sewing applied to aprons and undergarments taking measurments, drafting patterns, use of commercial patterns and the computation of cost. The drafting system and some materials are included in the deposit; other materials are provided by the student, subject to the approval of the instructor. Finished garments are the property of the student. I., 3. Miss Ballinger.

(12) **Dressmaking.** This course gives practice in designing and drafting patterns and making shirt waists and cotton dresses. I., 2. Miss Ballinger.

(13) **Textiles.** This course comprises a study of fabrics beginning with their place in primitive life and tracing their development, manufacture and economic value up to the present time. The laboratory work comprises the study of the physical and chemical natures for the common textile fibers. The methods of determining pure and adulterated fabrics, and the chemistry of laundry processes and dyeing. Prerequisites: Chem. (1). H. E. (11) and (12). Lecture, 1; laboratory, 1; I. and II., 4. Miss Ford.

(14) **Advanced Dressmaking and Tailoring** includes the making

of a dress for evening wear and the handling of wool materials. II., 3. Miss Ballinger.

(15) **Teachers' Course.** This course is planned for women who expect to teach domestic art. It deals with methods, lesson plans, courses of study and equipment. Prerequisites: H. E. (11), (12), (13), (14). Lectures, 2. II., 2. Miss Ballinger.

(16) **Embroidery.** This course deals with the principal stitches used in decorative art. The decoration of household linens, undergarments and dresses is given attention. I., 2. Miss Ballinger.

(18) **Special Credits.** Students who have practiced teaching in the Bozeman schools or in the college will be allowed credits (not to exceed 2) for this work.

PSYCHOLOGY AND ECONOMICS.

President Hamilton.

(1) **Psychology.** This course presents a general view of modern psychology and is required of all general science students. It gives a practical exposition of the materials and methods of psychological investigation. The lectures are accompanied by class demonstrations. Attention is given to such topics as the growth of the central nervous system, the nature of consciousness, sensory and motory training, the higher intellectual faculties and the will. So far as possible the work is made practical and concrete. I., 3.

(3) **Economics.** This course consists of a study of such subjects as land, capital, labor, money, coinage, banking, rent, interest, wages, and taxation. The most important questions in economics of the present time are considered. Among these may be mentioned trusts, labor organizations, government ownership of public utilities, co-operation, recent currency legislation, and the single tax. I. and II., 4.

(4) **Sociology.** The origin and history of human society, the various social theories and the laws of human intercourse are treated. Attention is given to such practical subjects as the government of cities, settlement work, the enrichment of country life, and charity work. Lectures and recitations. Elective. II., 3.

(5) **Advanced Economics.** A study of the organization of business, the problems of labor and capital, methods of securing capital for the development of industries, the work of utility commissions, and other economic and financial questions of importance to engineers and others engaged in the industrial pursuits. Prerequisite: Economics, (3). I., 3.

SECRETARIAL STUDIES.

Professor Brewer.
Miss Jones.
Mr. Wilson.

The department is well equipped with typewriters, neostyle, duplicators, etc. The college and experiment station offices afford opportunity for extensive study of a wide range of office fixtures such as the dictographs, adding machines, filing cases, etc.

(1) **Shorthand.** A thorough knowledge of the fundamental principles of shorthand practice in word building, phrasing and dictation. I., and II., 8.

(2) **Shorthand.** Additional drill in phrasing and word building. Practice in writing letters, legal papers, testimony, and miscellaneous matter, for the purpose of acquiring a large shorthand vocabulary. A speed of ninety to one hundred words a minute should be reached by the end of this year. I. and II., 6.

(3) **Typewriting.** Instruction in the use and care of typewriters. Exercise for the development of proper wrist and finger movements and for the mastery of the keyboard. Practice in letter writing and the use of carbon. I. and II., 8.

(4) **Typewriting.** Practice in transcribing from shorthand notes and from manuscript. Dictation for the attainment of speed and accuracy; also practice in the use of the mimeograph. I. and II., 6.

(5) **Business Correspondence.** A practice course in all forms of business correspondence. Attention is paid to spelling, punctuation, paragraphing and the correct arrangement of materials, both as to form and language. II., 3.

(6) **Office Practice.** Practice with the various kinds of office appliances and equipment, such as adding machines, duplicators, filing cases and card systems. Preparing copy for press and proof reading, typography and illustration. I., 4.

(7) **Business Methods.** A practical course in business methods, including the principles of business organization and administration. How to do business with the postoffice, banks, railroads, express, etc. I., 4.

(8) **Commercial Law.** A course in the principles of elementary business law. Students will be required to familiarize themselves with rights and liabilities growing out of the more common business relations. Principles governing the drawing and the validity of commercial paper will be emphasized. Text and occasional lectures by practicing attorneys. II., 3.

(9) **Principles of Accounting.** The course deals with principles governing accounting. The aim of the course is to enable the student to understand the principles underlying all accounting rather than to

confine him to a set system, but at the same time to enable him to quickly grasp the details of any system. I. and II., 6.

(11) **Shorthand.** A practical, advanced course; including special dictation practice for gaining additional speed. When possible opportunity will be given to assist in the actual work of an office. I. and II., 4.

(12) **Typewriting—Rapid Dictation.** Additional practice in transcribing from shorthand notes, also copying work for gaining additional speed on the machine. I. and II., 4.

PHYSICAL EDUCATION.

Mr. Bennion, Director of Physical Education for Men.
Dean Herrick, Director of Physical Education for Women
Miss McKinney, Instructor in Gymnastics for Women.
Dr. Herbert H. Judd, Medical Examiner.

This department is organized to provide the opportunity for the physical betterment of each and every student. Its function is not to reach a selected few, but to develop in all such physical habits as will promote vigor and efficiency.

The work of the department is organized under these: (a) **Educative.** (1) To perfect nervous control; (2) To gain mental and moral self-control; (3) To develop muscular strength and endurance. (b) **Hygienic.** (1) To aid function and correct undeveloped and deformed parts; (2) To teach right habits of living. (c) **Recreative.**

A thorough physical examination will be required of all new students entering the institution. On the basis of the information gained from this examination, suggestions for excuse and advice on health topics will be given each student.

Department for Men.

When military drill is not given, physical education (1) will be required of all first year men.

Physical education (3) is required of all sophomores, but may be elected by freshmen.

For required work, regulation gymnasium suits will be demanded.

Students will not be permitted in intercollegiate competition except under such conditions as are outlined by the Faculty Eligibility Committee and the Athletic Council.

(1) **Physical Education.** Elementary gymnastics designed to provide the amount of physical activity necessary to maintain health under college conditions and at the same times improve the carriage and control of the body. I. and II., 2 credits, two hours per week.

(2) **Physical Education.** Recreative gymnastics, similar to Physical Education (1) but more elastic, open to all who have completed course (1) or its equivalent. Two hours per week I. and II.

(3) **Physical Education.** Hygiene. Lectures on the following subjects: Personal hygiene; proper living on a physiological basis; causes and transmission of disease; public hygiene and sanitation; first aid to the injured, etc. Required of all sophomores. I. and II., 2.

(4) **Physical Education.** Athletics. The object of this course is to provide wholesome recreation, and promote individual alertness, rapidity of action, presence of mind, endurance, and co-operative team spirit. As far as time and opportunity will permit, some form of athletic activity will be offered to everybody.

While no college credit is given for this course, it may be advantageous to the student to have a record made of his athletic activity. In order to obtain a grade, a student must participate in at least one major or in two minor sports.

Department for Women.

The aim of the physical education department for women is to develop each woman to her highest economic value as a unit of society, to the end that when she finishes her college course she may carry forth into life a sane, well balanced, logical mind, high moral character and a strong symmetrical properly functioning body, capable of assuming and performing cheerfully and well the duties of cultured womanhood.

Students who are relieved for any reason of the requirements in physical training, shall present four additional credits in some other subject; but the president may, at his discretion, excuse from such requirements any student in the employ of the institution.

(1) **Physical Education.** Physical examination on entering. The chief aim throughout the year is to establish good posture and carriage and strengthen vital functions. The work will consist of Swedish body building work, some floor tactics, German rythmic dancing and games. Class exercises twice a week required.

(2) **Physical Education.** The work for the second year women will consist of lectures and recreational games. Classes required twice a week.

The physical education course for the girls of the School of Home Economics and Short Course will include a physical examination on entering, corrective and recreational gymnastics.

Indoor and outdoor tennis courts are furnished for the women and beginning classes are organized; competitive games are played between classes throughout the year.

A volley ball court makes a good game equipment for women.

All through the two years the course includes lectures on personal hygiene; general deportment for women; dress from the standpoint of health and appearance; the physiology of bodily exercise. The regulation gymnasium suit and shoes, which may be obtained from a local dealer will be required.

Women's Assemblies.

One hour each week is required of all women enrolled for an assembly meeting.

The assemblies are under the supervision of the women of the faculty and include lectures on personal and social hygiene, dress, care of the room, wall decorations, bed-making, habits, etc.

This course correlates with the every-day life of the women.

Secondary Schools

The department of secondary education is composed of the following schools:

I. School of Agriculture.
 (a) Three-Year Course.
II. School of Home Economics.
 (a) Four-Year Course.
 (b) Three-Year Course.
III. School of Mechanic Arts.
 (a) Four-Year Course.
 (b) Three-Year Course.
 (c) Traction and Stationary License Course.

TIME OF OPENING.

The School of Agriculture, the three year course in the School of Home Economics; the three year course in the School of Mechanic Arts and the Traction and Stationary Engineer License course opens Tuesday, October 5, 1915 and close Friday, March 31. The dates for opening and closing the four-year course in the School of Mechanic Arts and in the school of Home Economics are the same as for the college.

School of Agriculture

The School of Agriculture offers practical instruction to the young men from the farms of Montana who wish to fit themselves for successful farming. The courses offered are intended as a preparation for life rather than for college. The student is brought into actual contact with the problems connected with the farm and learns that agriculture is a profession requiring both skill and knowledge.

Students in this school have the privilege of studying a modern dairy in operation including types of the best breeds of dairy cattle; a complete poultry plant in operation containing breeds illustrating especially the best laying strains and market fowls; modern grain and soil laboratories; model farm buildings and barns, with pure bred livestock; the experiment station farm; greenhouses and orchards; the large biological, chemical and physical laboratories, and the well-equipped wood and iron shops of the engineering department.

The variety of animals included upon the farm affords ample opportunity to see the various diseases, injuries, etc., encountered in farm animals. In the veterinary building there is provided a clinic room, where sick and injured animals are treated, and the student is given the benefits of these demonstrations.

The course extends through three years of six months each and comes in the winter season when the young men can be spared from farm work. For admission to this school, students must have passed the eighth grade or its equivalent, or give satisfactory evidence to the principal of the school that they are capable of carrying on the work. Young men 21 years of age or over will be admitted to the course without having completed the eighth grade, provided they have had some practical experience on the farm and possess a fair common school education. Those who satisfactorily complete the course will be given diplomas.

SCHOOL OF AGRICULTURE

FIRST YEAR.

First Semester.		Second Semester	
English (Eng. f)	4	English (Eng. f)	4
Arithmetic (Math. a)	4	Agricultural Botany (Biol. b)	3
Physics (Phys. b)	5	Vegetable Gardening (Hort. b)	3
Animal Types (An. Ind. a)	2	Animal Types (An. Ind. b)	2
Carpentry (M. A. Sa)	2	Farm Machinery (Agron. e)	3
Mechanical Drawing (M. A. a)	2	Carpentry (M. A. Sa)	2
Military Drill or Physical Education (1)	1	Mechanical Drawing (M. A. b)	2
		Military Drill or Physical Education	1
	20		20

SECOND YEAR.

English (Eng. g)	2	English (Eng. g)	2
Plant Propagation and Ornamental Horticulture (Hort. a)	4	Chemistry (Chem. a)	5
Field Crops (Agron. a)	4	Field Crops (Agron. b)	4
Irrigation and Drainage (Agron f)	2	Breed Types (An. Ind. d)	2
Breed Types (An. Ind. c)	2	Farm Dairying (An. Ind. f)	4
Farm Poultry (An. Ind. e)	3	Forge (M. A. Sb)	2
Forge (M. A. Sb)	2	Military Drill or Physical Education (3)	1
Military Drill or Physical Education (3)	1		
	20		20

THIRD YEAR.

English (Eng. h)	2	English (Eng. h)	2
Farm Management and Accounting (Agron. d)	4	Soils (Agron. c)	4
Fruit Growing (Hort. c)	3	Plant and Insect Pests (Biol. c)	4
Feeding and Management (An. Ind. g)	3	Feeding and Management (An. Ind. h)	3
Animal Breeding (An. Ind. i)	3	Dairy Manufacture (An. Ind. j)	3
Common Diseases (Vet Sci. k)	4	Farm Motors (M. A. s)	3
	19		19

School of Home Economics

(a) Four-Year Course.
(b) Three-Year Course.

The School of Home Economics is designed especially to fit young women to become home builders. The well-equipped laboratories, kitchens, sewing rooms, dairy, greenhouses, etc., are admirably fitted for making instruction intensely practical.

The entrance requirements for the three-year and four-year courses are the completion of the eighth grade in the common schools or the equivalent. A diploma from the four-year course admits a student to the freshman class of the college. The young women who do not continue their studies have a practical training which fits them for home making, and which furnishes an excellent preliminary training for the vocations based upon domestic science and art.

The three-year course in this school extends through three years of six months each. Those who satisfactorily complete the course will be given diplomas.

HOME ECONOMICS.

FIRST YEAR.

First Semester.		Second Semester	
English Comp. (Eng. a)	4	English Comp. (Eng. a)	4
Algebra (Math. a)	4	Algebra (Math. a)	4
History (Hist. a or b)	4	History (Hist. a or b)	4
Textiles (H. E. c)	2	Drawing (Art a)	2
Sewing (H. E. a)	2	Sewing (H. E. a)	4
Drawing (Art a)	2	Physical Education	1
Physical Education	1		
	19		19

SECOND YEAR.

Rhetoric (Eng b)	4	Rhetoric (Eng. b)	4
Plane Geometry (Math. c)	4	Plane Geometry (Math. c)	4
Biology (Biol. a)	4	Biology (Biol. e)	4
Cooking (H. E. g)	4	Cooking (H. E. g)	4
Drawing (Art a)	2	Drawing and Handicraft (Art b)	2
Physical Education	1	Physical Education	1
	19		19

THIRD YEAR.

Literature (Eng. c)	4	Literature (Eng. c)	4
Physics (Phys. a)	4	Physics (Phys. a)	4
German (German a)	4	German (German a)	4
Dressmaking (H. E. b)	2	Dressmaking (H. E. b)	4
Household Decoration (Art c)	2	Household Sanitation (H.E. k)	2
Household Sanitation (H. E. k)	2		
	18		18

FOURTH YEAR.

Literature (Eng. d)	4	Literature (Eng. d)	4
German (German b)	4	German (German b)	4
Elementary Food and Nutrition H. E. h)	2	Elementary Food and Nutrition (H. E. h)	2
Algebra (Math. b)	4	Solid Geometry (Math. d)	4
Electives	3 or 4	Electives	3 or 4
	17 or 18		17 or 18

List of electives for the above: Trigonometry (Math. 2a); Metal (Art 13); Basketry (H. E. 14); China Painting (Art 10); History (Hist. d); Embroidery (H. E. d); Home Gardening (Hort. d); Home Dairying (A. I. e); Poultry (A. I. e); Music.

SCHOOL OF HOME ECONOMICS.

FIRST YEAR.

First Semester		Second Semester	
English (f)	4	English (f)	4
Sewing (a)	2	Sewing (a)	4
Textiles (c)	2	Agricultural Botany (b)	3
Drawing (a)	2	Chemistry (a)	5
Arithmetic (a)	4	Art (a)	2
Physics (b)	5	Physical Education	1
Physical Education	1		
	20		19

SECOND YEAR.

English (g)	2	English (g)	2
Cooking (g)	4	Household Sanitation (k)	2
Dressmaking (b)	3	Dressmaking (b)	4
Household Sanitation (k)	2	Vegetable Gardening (b)	3
Plant Propagation (a)	4	Home Dairying (l)	3
Poultry (e)	3	Cooking (g)	4
Physical Education	1	Physical Education	1
	19		19

THIRD YEAR.

English (h)	2	English (h)	2
Fruit Growing (c)	3	Plant and Insect Pests (c)	4
Soils (c)	4	Household Management (j)	4
Home Nursing (l)	2	Embroidery (d)	2
Household Decoration (c)	2	Elementary Food Nutrition (h)	2
Electiv	5 to 7	Elective	4 to 6
	18 to 20		18 to 20

Electives: Metal, Basketry, History, Music Algebra.

School of Mechanic Arts

(a) Four-Year Course.
(b) Three-Year Course.
(c) Traction and Stationary License Course.

The School of Mechanic Arts is designed principally for those who wish to do their own mechanical work on the farm, to prepare themselves to become shop foremen, electricians, section bosses, engine men, firemen, contractors, traction engine men, draftsmen, etc.

For admission to th four-year and three-year courses in this school, the equivalent of an eighth grade certificate is required.

The large and well-equipped science laboratories, drawing rooms, and shops provide facilities for work that will rank with the best secondary polytechnic schools. The instruction is given by the regular faculty members in their subjects. The four-year course includes the ten units required by the State Board of Education for admission to the freshman year of the state institutions.

The remaining units consist for the most part of industrial subjects. A unit consists of work to the amount of four sixty-minute recitations per week, for a period of 36 weeks. Two periods of laboratory, drawing or shop work shall count as one period.

Those who complete the four-year course in mechanic arts are eligible to enter the freshman class of the college. To those who satisfactorily complete either the three-year or four-year courses diplomas will be given.

The traction and stationary engine license course is introduced for the benefit of those who wish to prepare themselves for the operation of steam machinery, for which a state license is required. Information necessary for the state examination, as prescribed by law is dwelt upon. The State boiler inspector will deliver a course of six lectures each year on the state inspection of boilers, and at the end of each year he will give an examination for traction or third class license to students who have completed the time requirements.

MECHANIC ARTS.

FIRST YEAR.

First Semester		Second Semester	
English Composition (a)	4	English Composition (a)	4
Algebra (a)	4	Algebra (a)	4
Mechanical Drawing (l)	2	Mechanical Drawing (l)	2
Forge (b)	4	Woodwork (a)	4
General History (d)	4	General History (d)	4
Military Drill or Physical Education (1)	1	Military Drill or Physical Education (1)	1
	19		19

SECOND YEAR.

Rhetoric (b)	4	Rhetoric (b)	4
Plane Geometry (c)	4	Plane Geometry (c)	4
German (a)	4	German (a)	4
Mechanical Drawing (m)	2	Mechanical Drawing (m)	2
Pattern Work (e)	2	Pattern Work (e)	2
Forge (c)	2	Foundry (d)	2
Military Drill or Physical Education (3)	1	Military Drill or Physical Education (3)	1
	19		19

THIRD YEAR.

Literature (b)	4	Literature (c)	4
Physics (a)	4	Physics (a)	4
German (b)	4	German (b)	4
Mechanical Drawing (n)	2	Mechanical Drawing (n)	2
Foundry (d)	2	Machine Work (f)	4
Machine Work (f)	2		
	18		18

FOURTH YEAR.

Literature (d)	4	Literature (d)	4
Algebra (b)	4	Solid Geometry (d)	4
Mechanical Design (o)	4	Mechanical Design (o)	4
Machine Work (h)	2	Machine Work (h)	2
Steam Boilers and Engine (a).	4	Steam and Gas Engines (b)	4
or Electrical Practice (a)	4	or Electrical Practice (a)	4
or Industrial History (e)	3	or Industrial History (e)	3
	17 or 18		17 or 18

SCHOOL OF MECHANC ARTS.

FIRST YEAR.

First Semester		Second Semester	
English (f)	4	English (f)	4
Shop Arithmetic (e)	4	Algebra (a)	4
Mechanical Drawing (l)	3	Mechanical Drawing (l)	3
Forge (Sb)	3	Forge(Sb)	3
Carpentry (Sa)	3	Carpentry (Sa)	3
Military Drill or Physical Education (1)	1	Military Drill or Physical Education (1)	1
	18		18

SECOND YEAR.

English (g)	2	English (g)	2
Algebra (g)	4	Algebra (g)	4
Physics (c)	4	Physics (c)	4
Pattern or Cabinet Work (e)	3	Pattern or Cabinet Work (e)	3
Mechanical Drawing (m)	3	Mechanical Drawing (m)	3
Foundry (d)	3	Forge (c) or Foundry (d)	3
Military Drill or Physical Education (3)	1	Military Drill or Physical Education (3)	1
	20		20

THIRD YEAR.

English (h)	2	English (h)	2
Geometry (c)	4	Geometry (c)	4
Steam Boiler & Practice (Sp)	5	Steam and Gas Engines (Sr)	5
Mechanical Drawing (n)	3	Mechanical Drawing (n)	3
Machine Work (f)	3	Machine Work (f)	3
Leveling (w)	3	Water Measurement (y)	3
	20		20

The work of the first and second year will be given beginning in October, 1915. The work of the third year will be offered one year later.

TRACTION AND STATIONARY ENGINE LICENSE COURSE.

FIRST YEAR.

First Semester		Second Semester	
Shop Arithmetic (e)	4	Algebra (a)	4
Mechanical Drawing (l)	3	Mechanical Drawing (l)	3
Forge (Sb)	3	Forge (Sb)	3
Boilers, Steam and Traction Engines (Lp)	9	Boilers, Steam and Traction Engines (Lp)	9
Military Drill or Physical Education (1)	1	Military Drill or Physical Education (1)	1
	20		20

SECOND YEAR.

Algebra (a)	4	Algebra (a)	4
Physics (c)	4	Physics (c)	4
Mechanical Drawing (m)	3	Mechanical Drawing (m)	3
Heat (Lu)	2	Heat (Lu)	2
Boilers & Aux. (Lv)	4	Boilers and Aux. (Lv)	4
Steam Engines (Lx)	3	Steam Engines (Lx)	3
Military Drill or Physical Education (3)	1	Military Drill or Physical Education	1
	21		21

THIRD YEAR.

Geometry (c)	4	Geometry (c)	4
Machine Work (f)	3	Machine Work (d)	3
Steam Boilers and Aux (Lz)	3	Steam Boilers and Aux. (Lz)	3
Steam and Gas Engines (Lr)	6	Steam and Gas Engines (Lr)	6
Electrical Practice (Lt)	4	Elect. Practice (Lt)	4
	20		20

The work of the first and second year will be given beginning in October, 1915. The work of the third year will be offered one year later.

DESCRIPTION OF THE WORK.

AGRONOMY.

(a) **Field Crops.** This course includes a study of the methods of growing and producing oats, wheat, flax, rye and corn. First semester, 4 credits. Lectures, 3; laboratory, 1.

(b) **Field Crops.** This includes a study of all forage crops, and grasses. Second semester, 4 credits. Prerequisite: Agronomy, (a). Lectures, 3; laboratory, 1.

(c) **Soils.** This course considers the formation and classification of soils, and includes a study of tillage and the methods for keeping up the soil's productiveness. First semester, four credits.

(d) **Farm Management and Accounts.** In this course students are taught the practical methods of managing a farm. Second semester, four credits.

(e) **Farm Machinery.** This course includes a study of the various types of farm machinery. Special emphasis is laid on the selection, adjustment and care of farm machinery. The course will also include instruction on the modern farm conveniences, such as telephones, water supply systems, etc. Prerequisite: Physics (d). Second semester, three credits.

(f) **Irrigation and Drainage.** Includes a study of the different methods of irrigating and draining land. Prerequisite: Physics (b). First semester, two credits.

ANIMAL INDUSTRY.

(a) **Animal Types.** A study of the market types of cattle and sheep. Laboratory 2. First semester, 2 credits.

(b) **Animal Types.** Judging of the market types of dairy cattle, horses and swine. Laboratory, 2. Second semester, two credits.

(c) **Breed Types.** Includes a study of the breed types of cattle and sheep. Prerequisites: Animal Industry (a) or (b). Lecture, 1; laboratory 1. First semester, two credits.

(d) **Breed Types.** Includes a study of breed types of dairy cattle, horses and swine. Prerequisite: An. Ind. (a) or (b). Laboratory, 1. II., 2.

(e) **Farm Poultry.** A study of the various breeds and their adaptability to farm use. Housing, feeding, incubation and brooding will also be taken up. The laboratory time will be spent in judging birds, operating incubators and brooders, and making a study of such poultry problems as time will permit. Lecture, 1; laboratory, 2. First semester.

(f) **Farm Dairying.** Includes a study of the methods of handling cream and butter upon a small dairy farm. Lectures, 2; laboratory, 1. Second semester, three credits.

(g) **Feeding and Management of Live Stock.** In this course the

student receives instruction as to the different methods of feeding and managing cattle and sheep. They are also taught the different methods by which these animals are prepared for the show ring. Prerequisites: Animal industry (c) and (d). Lectures, 2; laboratory, 1. First semester, three credits.

(h) **Feeding and Management of Live Stock.** A study of the methods of feeding, showing and managing horses and hogs. Prerequisites: Animal Industry (c) and (d). Lecture, 1; laboratory, 2. Second semester, three credits.

(i) **Animal Breeding.**....This course includes a study of the principles of breeding as directly applied to the farm. Cross breeding, inbreeding and line breeding are taken up. Prerequisites: Animal Industry (c) and (d). First semester, three credits.

(j) **Dairy Manufacture.** This course includes a study of the creamery methods of making butter and cheese. Prerequisite: Animal Industry (f). Lecture, 1; laboratory, 2. Second semester, three credits.

(k) **Common Diseases.** The aim in this course is to first give the student lectures upon the physiology of the digestive, respiratory and blood vascular systems in order to prepare him for a more comprehensive study of the common diseases. It also includes a study of the various kinds of wounds and their treatment, general conformation and care of the teeth and some of the more common ailments in all species of domestic animals. During the second semester, lectures will be given on the care and handling of breeding animals and accidents and diseases attendant upon parturition. First semester, four credits.

(l) **Home Dairying.** This course will be taken up from the standpoint of actual practice in the home. It will include a study of the composition, properties and uses of milk and its products; care and handling of dairy products; inspection, adulterations, modification, fermentations, manipulation of tests and manufacture of butter, cheese and frozen products. Lectures, 2; laboratory, 1. II., 3 credits.

BIOLOGY.

(a) **Biology.** This course will be conducted in such manner as to give the students a well balanced course in elementary botany. The object of the course is not to train botanists, but rather to give the student a foundational knowledge of botanical science and its bearing on every day life. Recitations, demonstrations and laboratory. 1., ½ unit.

(b) **Agricultural Botany.** The elements of botany are taken up, especially with a view to the needs of agricultural students. The classification, structure, physiology and ecology of plants, are briefly covered. Special attention is given to farm weeds. Lectures, 2. II., 3.

(c) **Insect Pests and Plant Diseases.** A study of the more com-

mon pests and diseases of plants found in Montana together with methods of preventing or controlling them. Second semester, 4 credits, Lectures, 4.

(e) **Elementary Physiology.** An elementary course in physiology covering the main facts of general anatomy and physiology of the human body. Nutrition, the blood and circulation, respiration, excretion, nervous system and its function, and the special senses, are among the topics covered. II., ½ unit.

CHEMISTRY.

(a) **Elementary Chemistry.** Includes a study of the fundamental principles of chemistry and their relation to agriculture. II., 5.

DRAWING.

(a) **Drawing.** Freehand drawing from geometric solids and casts. Study of light and shade. Object drawing, in charcoal, pencil, and pen and ink. Study of linear perspective with practical exercises in perspective sketching. I. and II., ½ unit.

(b) **Drawing.** A continuation of course (a) with study of design and handicraft at the discretion of instructors. I. and II., ½ unit.

(c) **Household Decoration.** Study of line, form and color as applied to the furnishing of a home. I., ¼ unit.

ENGLISH.

(a) **English Composition.** The aim of the course is to secure accurate and effective expression, and to afford constant exercise in composition. In connection with this work English classics will be made the subject of a class room study, forming a basis for the study of literature. I. and II., 1 unit.

(b) **Rhetoric.** This is a continuation of course (a). Each student is required to do considerable written work beside work in the text book. I. and II., 1 unit.

(c) **Literature.** The object of this course is to develop an intelligent appreciation of American and English masterpieces and to promote a taste for the best literature. A series of classics similar in number and kind to the New English College requirements are the material for critical class room study. The student will find in the library valuable works of reference. Some written work will be required. I. and II., 1 unit.

(d) **Critical Study.** The purpose of this course is to apply the principles as laid down in composition and rhetoric. It will consist of a study of the classics, writing of themes, oral discussions and library and home reading assignments. I. and II., 1 unit.

(f) **English Exercises.** The first year is devoted to practice in

spelling, punctuation, note taking, letter writing, and the simpler forms of composition. The work is based on Hanson's Two Years in English. I. and II., 4.

(g) **English Composition.** This includes a study of the paragraph and its development, sentence structure and words. Much practice in oral and written composition is required. A few masterpieces are read as a basis for a careful study of good style. First and second semesters. Two credits each semester.

(h). **Composition and Literature.** The course for the third year provides for a brief study of the forms of literature. The study and writing of narration, description, exposition, and argument is required. At least one good example of each of the four forms of composition is studied in class. I. and II., 2 credits each.

GERMAN.

(a) **Beginning German.** The work of the first year includes pronunciation, grammar, selections in prose and verse with practice in speaking and writing German. I. and II., 1 unit.

(b) **Second Year German.** Texts suitable for second year work; for the most part, the writings of contemporary authors. Memorizing of easy colloquial sentences and poems. Conversation and composition. I. and II., 1 unit.

HISTORY.

(d) **General History.** In this course the student will study Greek and Roman history with a brief sketch of Medieval institutions as an introduction to more extended work in Modern history. He will have a text book but will also use the reference books in the library in looking up special topics. I. and II., 1 unit.

(e) **Industrial History.** A course in which our industrial development is taken up from the standpoint of boys and girls of high school age is offered as an elective. The text book in the hands of students will be supplemented by special topics. I. and II., 6.

HOME ECONOMICS.

(a) **Sewing.** The fundamental principles of hand and machine sewing applied to the making of aprons and undergarments—students provide suitable materials. The finished work is the property of the student. I., 2; II., 4.

(b) **Dressmaking.** Designing, cutting and making simple dresses is a part of the work. I., 2; II., 4.

(c) **Textiles.** A study of cotton, wool, silk and linen in regard to its microscopical structure, physical properties, manner of growth,

and manufacture into cloth. Simple tests for adulteration are discussed. Sample note book is kept. I., ¼ unit.

(d) **Embroidery.** Embroidery of household linens and wearing apparel; weaving rugs and pillows.

(g) **Cooking.** The object of the course is to teach plain cooking breads, meats, eggs, cereals, soups, salads, preserving fruits, cakes, candy and simple desserts. Visits to the meat market to study cuts of meat. The students are shown how biology and chemistry apply to the preparation of foods. Lectures, 2; laboratory, 2. I. and II., 8.

(h) **Elementary Food and Nutrition.** This course treats of the general principles of human nutrition. Some attention is given to invalid cookery. I. and II., 4.

(j) **Household Management.** The expenditure of the income, furnishings with reference to economy and efficiency, also the working out of a number of home problems by each member of the class. II., 4.

(k) **Household Sanitation.** The location of the house, house plans, finishing and furnishing of the home, are discussed from a sanitary standpoint. Source of water supply, and preservation of food are also included. I. and II., 2.

(l) **Home Nursing.** This course includes the care of the sick room, making beds, bathing, bandaging, emergencies, etc. I., 2.

HORTICULTURE.

(a) **Plant Propagation and Ornamental Horticulture.**—A study of the various methods of plant propagation with special reference to the methods of multiplying fruit and ornamental plants. The latter part of the course deals with the simple principles of ornamental planting and ornamental plants adapted to Montana conditions. I., 4.

(b) **Vegetable Gardening and Small Fruit Culture.** This course deals with methods of growing, gathering, storing, and marketing the more important vegetable crops; hotbed construction and management; and with the growing of such small fruits as the strawberry, raspberry, blackberry, currants, and gooseberry. II., 3.

(c) **Orcharding.** The subjects of selecting the sites, planning and planting, cultivation, irrigation, pruning, and general care of the orchard are discussed, more especially from the standpoint of the home orchard. Prerequisite: Horticulture (a). I., 3.

(d) **Home Gardening.** A course offered as an elective in the secondary home economics course. An elementary course dealing with the simple principles of plant propagation, vegetable gardening, small fruit culture, and ornamental gardening. Lectures, 4. I., 4.

MATHEMATICS.

(a) **Algebra.** This includes the following subjects: Addition, subtraction, multiplication, division, equations of the first degree with

one unknown number, simultaneous equations of the first degree, factors, highest common factor, lowest common multiple, quadratic equations, simultaneous equations above the first degree, theory of indices (positive, negative, fractional, and zero), and radicals. I. and II., 1 unit.

(b) **Advanced Algebra.** Simultaneous quadratic equations, graphical representations of simple equations in two variables; theory of indices, (positive, negative, fractional, zero), radicals, etc. I., ½ unit.

(c) **Plane Geometry.** This includes, in addition to the work given in the standard texts, a large number of original exercies. Prerequisite: Algebra (a). II, 1. 1 unit.

(d) **Solid Geometry.** In this course special attention is given to the geometry of the sphere. Prerequisite: Algebra (a) and (b) and geometry (c). II., ½ unit.

(e) **Shop Arithmetic.** This course is designed to develop skill and accuracy in the fundamental processes of arithmetic. The problems will be chosen very largely of the type the student will actually encounter in connection with his mechanical work. I., 4.

(f) **Industrial Arithmetic.** The purpose of this course is to develop skill and accuracy in the fundamental processes of arithmetic and relate the work to farm experience. The student will be prepared to handle the mathematical problems connected with the work of the shop and laboratory. I., 4.

(g) **Algebra.** The course covers the same work as algebra (a). Offered to the students of the three year mechanic arts course. II., 4. I., 4. II., 4.

MECHANIC ARTS.

(a) **Wood Work.** Joinery, consisting of a series of exercises designed to develop skill in the use and care of bench tools, and proficiency in reading simple working drawings. Turning, comprising spindle, face plate and chuck work in the manufacture of simple patterns and standard articles for shop use. House carpentry, illustrating the methods and principles of framing, rafter and stair cutting, mill work and finishing. Cabinet work, in which standard wood shop machinery is used. II., ½ unit.

(Sa) **Carpentry**.....The use and care of carpentry tools. A series of exercises in joinery, followed by practice in framing and rafter and stair cutting. Second year, first semester, 2 credits, 2 laboratories; second semester, 2 credits, 2 laboratories.

(b) **Forge Work.** The operation of hand and power forges and manipulations of the fire, with progressive exercises in iron forging designed to teach the operations of drawing, upsetting, bending, forming and welding. The work includes the forging and welding of mild and tool steels, as well as the hardening and tempering of simple hand tools. I., ½ unit.

(5b) **Forge.** Care and manipulation of fire, iron forging, including the operation of drawing, upsetting, pointing, bending, welding, calculation of stock; implement repairs, plow pointing, manufacture of chains, hooks, clevises, clips etc. First year, first semester 2 credits. 2 laboratories; second semester, 2 credits, 2 laboratories.

(c) **Forge Work.** A continuation of (b) in forging and tempering hand tools, lathe tools, foundry tools, springs, drills and reamers, including annealing and case-hardening. I., ¼ unit.

(d) **Foundry.** A course in bench and floor moulding in green sand. Casting in white metal, brass and cast iron are poured for use in the machine shop. I. and II., ½ unit.

(e) **Pattern Making.** Instruction in the methods of making proper allowances on patterns for draft, shrinkage and finish, and practice in the construction of patterns for pulleys, hangers, machine parts and pipe fittings, with the necessary core boxes. I. and II., ½ unit.

(f) **Machine Work.** Bench work, including chipping, filing, scraping, fitting, soldering, brazing and babbitting. Machine tool work on drill press, shaper, planer and lathe. I. and II., ¾ unit.

(h) **Machine Work.** Students choosing this subject are given advanced work on lathe, milling machine and grinder, with practice in hardening and tempering taps, dies, cutters and high speed steels. I. and II., ½ unit.

(k) **Mechanical Drawing.** The elements of lettering, use of tools in simple geometrical constructions, isometric orthographic representations, working drawings. Farm building construction; plans, elevations, framing details, bills of material. Details of orms for concrete work, silo construction, plumbing and sanitation. Farm maps. Text: "Agricultural Drafting," Howe. Laboratory, 4. I. and II.

(l) **Mechanical Drawing.** Lettering. The shape and proportions of letters, freehand construction. Geometrical construction, freehand sketching of simple machine parts, reproduced in detailed working drawings; orthographic projection in the third quadrant. I. and II., ½ unit.

(m) **Mechanical Drawing.** A continuation of (a) in machine and architectural detail drawing, tracing and blue-printing; isometric and cabinet projection; intersections and development of surfaces with applications in roof framing and sheet-metal work. I. and II., ½ unit.

(n) **Mechanical Drawing.** Machine drawing and the elementary principles of mechanism; screws, threads, screws and bolts; pulleys and belting; gear toothcurves, gears in train, change gears. I. and II., ½ unit.

(o) **Mechanical Design.** Machine drawing and elementary design, covering bearings and journals, spur, bevel and screw gears, differentials and change speed mechanism, engine parts, quick returns, punches, shears, presses. Two hours recitation, four hours drawing. I. and II., 1 unit.

(p) **Steam Boilers and Practice.** The construction and operation

of steam boilers, and their auxiliaries, including the care of boilers, their strength and evaporative capacity, the physical properties of steam, combustion of fuel, pumps, injectors, feed water heaters, condensers. Prerequisites: Physics, mechanical drawing (a), (b), and machine work (f). I., ½ unit.

(Lp) **Steam Boilers and Practice.** Four hours recitation and six periods practice per week. I. and II.

(Sp) **Steam Boilers and Practice.** Construction and operation of steam boilers and auxiliaries. Prerequisite: Physics (c), 2 recitations and three practice periods per week. I.

(r) **Steam and Gasoline Engines.** The construction and operations of steam and gasoline engines and tractors, valves and valve gears, governors; lubricators; indicator cards, indicated horse power, brake horse power, efficiency. Prerequisite: M. A. (a). II., ½ unit.

(Lr) **Steam and Gasoline Engines.** Three hours recitation and three periods practice per week. I. and II.

(Sr) **Steam and Gas Engines.** Construction and operation of stationary and tractor steam and gas engines, motor trucks and automobiles. Prerequisite: (Sp). Two recitations and three practice periods per week. II.

(s) **Farm Motors.** A study of the various motors adapted to use on the farm, particularly the gas engine, with practice in operating and locating troubles. Tractor practice and study of simple stationary installations. Lectures, 1; laboratory, 2.

(t) **Electrical Practice.** Elementary principles of electricity, electric wiring, management and care of electrical machines and apparatus, including dynamos and motors, batteries, electric lights, telephones and telegraph apparatus. Text book: Essentials of Electricity, by Timbie. Prerequisite: Physics (c). Recitations and practice four times per week. I. and II.

(Lu) **Heat.** Effects of heat as applied to the operation of the steam boiler and the steam and gasoline engine. Transformation of heat into work. Principles of expansion and compression. Recitations twice a week. I. and II.

(v) **Leveling.** Use of the chain and level. Determination of slopes and distances. Measurement of plane areas. Slopes for running water in ditches. One recitation and two practice hours per week. I.

(Lv) **Steam Boilers and Auxiliaries.** Continuation of course (Lp), applied to stationary boilers. Recitations and practice four times per week. I. and II.

(Lx) **Steam Engines.** Elementary course in steam engines. Construction and operation. Valve gears. One recitation and two practice periods per week. I. and II.

(y) **Water Measurement.** A study of the flow of water. Measurement of water by means of weirs and current meters. Hydraulic

rams. Small water power installations. One recitation and two practice hours per week. II.

(Lz) **Steam Boilers and Auxiliaries.** Continuation of course (Lv). Recitations and practice three times per week. I. and II.

PHYSICS.

(a) **Elementary Physics.** Lectures with experimental illustrations, recitations, assigned problems, and laboratory work four hours per week throughout the year, in mechanics, sound, heat, light, electricity and magnetism. Text book: A First Course in Physics, by Millikan & Gale. I. and II., 1 unit.

(b) **Elementary Physics.**—Includes experimental lectures, recitations and assigned problems on mechanics, heat, light and electricity. Emphasis will be placed upon those subjects that have a direct bearing on applied agriculture. I., 5.

(c) **Elementary Physics.** Demonstration lectures, assigned problems, and recitations in mechanics, heat, electricity and magnetism, light and sound. As far as possible, illustrations will be drawn from practical sources and problems of practical interest will be assigned. Text book: A First Course in Physics, by Millikan & Gale. I. and II., 8.

PHYSICAL EDUCATION.

(a) **Elementary Gymnastics.** Includes general setting up exercises, a small amount of apparatus work, recreative group games, and short talks on personal hygiene. Required of all first year men. Two hours, I. and II.

School of Music

PAUL P. McNEELY, Mus. B. (Washburn College); A. B. (University of Kansas); Lhevinne, Berlin.
Director of School of Music and Instructor in Piano and Musical Theory.
U. HOLMES BISHOP, (New England Conservatory of Music).
Instructor in Voice and Conductor of Singing Organizations.
FRED O. JACKSON (National Conservatory of Music).
Instructor in Violin and Conductor of Orchestra.
MISS JUNE HARTMAN, B. S., (Montana State College).
Instructor in Piano and Organ.
LOUIS L. HOWARD (Boston Conservatory of Music).
Director of Band and Instructor in Band Instruments.

ADVANTAGES OF COLLEGE INSTRUCTION.

The advantages of college over private instruction are very numerous and quite obvious to any one giving the matter serious thought. When a student is seeking the services of a private teacher, he must form his judgment as best he can on that person's fitness for his vocation, while it is certain that the teachers of a successful college are selected mainly on account of their ability, as it would not be in the best interests of such an institution to sacrifice its reputation by employing other than good teachers. Again, the stimulating atmosphere of a music school is another distinct advantage over private instruction.

The music departments are organized for a four-fold purpose:

1. To combine music and literary studies as a broad basis for regular collegiate instruction.
2. To use the art of music for intellectual, esthetic, and moral culture.
3. To teach all branches of music to special and general students.
4. To educate teachers of music.

DEPARTMENTS OF INSTRUCTION.

I. Course for the pianoforte.
II. Course for the voice.
III. Course for the violin.
IV. Course for the organ.
V. Course for harmony, counterpoint, analysis, and history of music.
VI. Course for orchestral and band music.
VII. Instruction in chorus singing.

GENERAL INFORMATION.

1. No time limit can be designated for the satisfactory completion of any course on account of difference in degree of musical ability; much also depends upon the preparation made, and upon the amount of time and careful attention the student can devote to the pursuit of a chosen study.

2. Students who present themselves as candidates for graduation must have completed a high school course or its equivalent and give evidence of a requisite musical talent and capacity. Each student must give during the last year of study one public recital in addition to the final performance at the commencement concert. Students preparing for graduation are required to take two private lessons a week for two years at least with the head teacher of the department, and it is necessary that resident students should study with teachers of the college for at least two years.

3. For graduation, four semesters' work in harmony will be required, and one year in the history of music, and a thesis.

4. The study of music has been placed upon an equality with other electives, and a limited number of credits may be counted toward a degree.

5. Diplomas will be granted to students who have done satisfactory work and passed the required examinations.

6. Tuition rates are payable in advance for each term of twelve weeks. No reduction will be made for temporary absence from lessons or for lessons discontinued. Lessons missed by the teacher will be made up at the mutual convenience of teacher and pupil.

7. All college students who take work in music shall be enrolled in at least twelve credits of work (including, if so assigned, work in harmony and musical history), in addition to the work in vocal and instrumental music. Students residing at home may be excused by the faculty from such requirements, upon request of their parents. Work is recommended in home economics, languages, literature, history and art.

Students not candidates for a preparatory diploma or a college degree, who are taking music in combination with other work of the college, shall be registered by the head of the department of home economics.

Those students not taking other college work are classed as "Music Specials."

8. The department is closed on the college and national holidays. Lessons falling on these days will not be made up.

9. No student is permitted to take part in any public performance without consent of the director.

10. Tuition fees are subject to change from year to year.

EQUIPMENT.

The School of Music of the college occupies half of the third floor of Montana Hall. The large assembly room is used for recitals. The school is well equipped with pianos, both grand and upright.

CONCERTS AND RECITALS.

Concerts are frequently given by the instructors and advanced students.

Recitals are given bi-monthly by the students of the school, at which work studied in the class room is performed before a small audience of fellow students and friends. Every student is required to take part in the program at least twice a year. These semi-public appearances are of great assistance in enabling the student to acquire the ease and self-possession so essential to a successful public performance.

ENSEMBLE AND SIGHT PLAYING.

In this branch of instruction lie indispensable elements of musical culture, to be obtained through no other mode of training.

Ensemble training develops the pupil's ability in reading at sight, and enables them to acquire a knowledge of compositions ordinarily inaccessible to the pianoforte student.

Prima vista reading of four-hand arrangements, and transcriptions of the symphonies, operas, string quartettes and chamber music generally, for two pianos, are studied. Piano accompaniment playing for voice, violin and other solo instruments receives special attention.

During the year, one or more ensemble recitals are given.

PIANO DEPARTMENT.

The regular course in piano-forte is covered by five grades, Preparatory, Freshman, Sophomore, Junior and Senior; and the Post Graduate course by one. Examinations will be held twice a year—at the end of each semester. Regular students may not poss from any grade without examination. While it is not obligatory for students to take these examinations, yet they are encouraged to take them because they have something definite before them, their ambition is stimulated and a better quality of study is secured. The pieces used for these examinations will be chosen from a list arranged by the director of the music department.

Special attention will be paid to the following points in the examinations:

Excellence of technique.

Accuracy of notation and correctness of fingering.

Phrasing and rhythm.
Discretion in use of pedals.
Choice of tempo and steadiness in time.
Quality of touch and tone.
Artistic interpretation.
Memory playing.

PREPARATORY PIANO COURSE.

Technical exercises—Hanon and later Phillipp, throughout all courses. Czerny-Germer, Studies II.; Duvernoy. School of Mechanism, op. 120; Koehler, op. 50; Heller, op. 45 and 47; Kuhlau's Kinderleben; Sonatas by Clementi and Kuhlau.

COLLEGIATE PIANO COURSE.

Freshman Examinations.

Candidates must be prepared to play from memory six pieces or sonatas, such as Mendelssohn's Songs Without Words; Schubert's Impromptus; Sonatas by Haydn and Mozart; or other appropriate selections from classic and modern compositions.

Technic. All scales, hands together, in quarter, eighth and sixteenth, separately, staccato and legato; triads in all keys; arpeggios in three positions, hands separately.

Studies. Czerny, School of Velocity; Cramer, Studies; Bach, Two-part Inventions, and French Suites.

Sophomore Examinations.

Candidates must be prepared to play from memory eight pieces selected by the instructor, one number of which must be by Bach, and one number of the eight must be prepared without assistance.

Appropriate selections from classic and modern compositions will be studied including Beethoven's Sonatas; Concertos by Mozart, Hummel, etc.

Technic. All scales, hands together, in quarter, eighth and sixteenth notes, metronome at 69. Triads and four-note chords with different touches. Arpeggios formed on all major and minor triads with their inversions, metronome at 84, hands separately. Staccato octaves in any scale required.

Studies. Cramer, Studies, continued; Clementi, Selections from Gradus ad Parnassum; Jensen, op. 32; Bach, Three-part Inventions and English Suites.

Junior Examinations.

Candidates must be prepared to play from memory eight pieces selected by the instructor, one number of which must be by Bach,

one by Beethoven and one by Chopin or Schumann. One number of the eight must be prepared without assistance.

Concert selections from classic and modern composers will be studied including Chopin's Prelude; Bach, Well-Tempered Clavichord; Concertos by Beethoven, Mendelssohn, etc. Selections from Henselt's op. 2 and 5.

Technic. Major and minor scales, hands together, similar and contrary motion, metronome at 105. Also major scales, hands together in thirds, sixths, and tenths, metronome at 100. All chord forms. Arpeggios formed on the major and minor chords and on the diminished seventh chords, with inversions, metronome at 92. Staccato octaves in major and minor keys, hands together.

Studies. Gradus continued; Moscheles, Etudes, op. 70; Kullak, School of Octaves; Chopin, Etudes.

Senior Examinations.

Candidates must be prepared to play from memory eight pieces selected by the instructor, one number of which must be by Bach, one by Beethoven, and one by Chopin or Schumann. One number must be a concerto. One number of the eight must be prepared without assistance.

Concert selections from Schumann's greatest works (David, Bundler-Tanze or Carnaval); Sonatas and Concertos by Beethoven, von Weber, Greig, etc., and pieces by modern composers.

Technic. All major and minor scales in octaves, tenths, sixths, and thirds, metronome at 120. Scales must also be played with crescendos and diminuendos, two notes against three, and three notes against four. All chord forms, solid and broken, with any touch required. Arpeggios formed on all major and minor chords, also the dominant seventh, and diminished seventh chords, all with inversions, metronome at 108. All octave forms will be required.

Studies. Chopin's Etudes, op. 10 and 25; Rubinstein, Selected Studies; Bach, Well-Tempered Clavichord, continued.

Post Graduate Examinations.

Candidates must be prepared to play eight numbers selected by the instructor. One post graduate number of the eight must be prepared by the candidate without assistance.

The most advanced works in the piano repertory will be studied, as Chopin's etudes and Godowski's arrangement of same; modern etudes by Liszt, McDowell, Moszkowsky, etc. Transcriptions of Bach's organ pieces by Liszt, Busoni, etc.; Schumann's Etudes Symphonics or a set of Brahms' Variations; concert pieces and concertos by modern composers.

Technic. All scales in similar and contrary motion, the legato in

quarter, eighth and sixteenth notes; staccato (hand and finger touch) in quarter and eighth notes, metronome at 176. All chord forms solid and broken, metronome at 160. Arpeggios on all major and minor chords; also dominant seventh chords, with inversions, the legato in quarter, eighth and sixteenth notes; staccato (hand and finger touches) in quarter and eighth notes. The seventh chords to be played also in triplet rhythms, metronome 176. Octaves in major, minor and chromatic scales, hands together, in similar motion, with any variety of touch required. The staccato in quarter, eighth and sixteenth notes; the legato and arm touches in quarter and eighth notes only. All major, harmonic, minor and chromatic scales in double thirds, fourths and sixth legato and staccato.

MUSICAL THEORY.

The courses in harmony presupposes a thorough knowledge of the rudiments of music and some proficiency in piano playing.

The following courses are required of all students in the regular musical courses, excepting courses 5 to 9, which are optional:

(1) **Harmony.** The study of overtones, scales, intervals, triads, and seventh chords and their inversions. The practical work consists of harmonizing melodies in soprano or bass and playing chord progressions at the piano. First year, twice a week first semester.

(2) **Harmony.** The study of close and open harmony, dominant ninth and diminished seventh chords, modulations. Practical work continued. First year, twice a week, second semester.

(3) **Harmony.** The study of modulation, irregular resolutions, altered chords, suspensions, passing tones, organ point, harmonization of florid melodies. Practical work continued. Second year, twice a week, first semester.

(4) **Musical Analysis.** Review of harmony, analysis of two and three part song and song with trio. Classical models with original work. Second year, twice a week, second semester.

(5) **Counterpoint.** The different orders of single counterpoint in two, three, and four parts. Third year, once a week, first semester.

(6) **Counterpoint.** Double and triple counterpoint. Counterpoint in the twelfth and fifteenth and in more than four parts. Modern counterpoint. Third year, once a week, second semester.

(7) **Musical Composition.** The theme and variation, dance and song forms. Analysis of classical models and practical work. Third year, first semester.

(8) **Musical Composition.** The sonata and rondo forms; analysis of classical sonatas; original work. Third year, second semester.

(9) **Musical History.** A survey of music from the earliest times. Lectures, discussions and assigned readings. First year, once a week, second semester.

(10) **Musical History.** This course deals principally with modern

music. Lectures, reports and class discussions. First year, once a week, second semester.

(11) **Thesis.** All candidates for graduation in any department of the school of music must write a creditable thesis on some phase of music or the other allied arts.

VOCAL DEPARTMENT.

Instruction in this department aims to develop a high musical taste and ability in the singer, as well as in the voice. Along the course of study is voice placement, vowel study and their application to words; rythm, phrasing, enunciation, and song interpretation. Songs are selected from the works of the best writers, both foreign and native. Studies in vocalization include works of concone, Vaccai, Sieber, Marchesi, Lutgen, etc.

No student of the vocal art can reasonably expect to achieve any great degree of proficiency without a certain amount of general culture. To this end, harmony should be studied; languages, especially German, French and Italian; a good command of English is necessary; chorus work is of an almost indispensable value; and every singer should be able to play on the piano song accompaniment of moderate difficulty.

Candidates for graduation must have completed an accredited high school course or its equivalent; must be able to sing intervals, scales, arpeggios and sustained tones; must have completed one year each of harmony and history of music; two years each of French and German languages and one year of Italian for which Spanish may be susbstituted; two years of piano (secondary); two years of chorus if required; and must be able to read at sight with a reasonable degree of accuracy. The repertoire should be extensive so as to include compositions of the French, German and Italian masters, as well as those of the English and American writers of note.

Chorus. The choruses are the Male Glee Club and the Ladies Glee Club. The aim of these organizations is to promote college life and spirit and give the students opportunity to develop musically. From time to time public exhibitions are given of the works studied.

Male Glee Club. Men students who have the necessary range and quality of voice are admitted. Music and instruction is free. Rehearsals are held twice a week under the direction of the instructor of vocal music. College and home songs as well as the works of the foremost American composers are studied.

Ladies' Glee Club. This club consists of sixteen voices, otherwise it corresponds with the Male Glee Club. The same type of music is studied, and the rehearsals are held twice a week. Twice a year the clubs appear in joint concerts performing the works studied, and forming also a mixed chorus. Separate appearances are frequent.

VIOLIN DEPARTMENT.

The work of the violin department is covered by five grades. Preparatory, Freshman, Sophomore, Junior and Senior. Examinations will be held twice a year at the end of each semester and it will be necessary for the student to play six major and their relative minor scales in one, two and three octaves, according to the grade of the student. Also one study selected by the instructor on day of examination and one study prepared by the student.

Preparatory Violin Course.

Dancla; Conservatory Method, Books I. and II.; Dancla, School of Velocity; Schradieck, Major and Minor Scales in one octave; Dancla and Mazas, Special Sight-reading Duos.

Collegiate Violin Course.

Freshman.

Technic. Scales in two octaves. Scales in double stopping thirds and sixths.

Studies. Mazas, Etudes Speciales, Book I.; Schradieck, Exercises to increase firmness in different positions; Dancla, op. 122; Hans Litt, op. 32, Book II.; ensemble playing.

Sophomore.

Technic. Scales in three octaves, double stopping in thirds, sixths and octaves.

Studies. Mazas, Etudes Brilliantes, Book II.; Schradieck exercises for double stopping, Book II.; Etudes by Singer, Allard, David, interspersed with compositions of Raff, Beethoven, Dancla, Bohm, etc. Ensemble playing.

Junior.

Technic. Scales in three octaves. Scales in double stopping in thirds, sixths, octaves and tenths.

Studies. Mazas, Etudes d'Artistes, Book III.; Hans Litt, op. 80, Twenty-four studies in different keys (preparatory to Kruetzer Studies); Kreutzer, Forty-two Studies; Compositions by DeBeriot, Bach, David, Vieux temps, etc.; Sonatas by Mozart. Ensemble work from the best masters.

Seniors

Technic. Scales in three octaves. All double stops and chromatics.

Studies. Rode, Twenty-four caprices; Florillo, Thirty-six Etudes; Compositions by Mendelssohn, Dvorak, Brahms, Moszkowski, etc. Sonatas by Beethoven. Ensemble playing from the best masters.

The Orchestra. All violin students who are sufficiently advanced

are admitted to the College Orchestra and in as much as the orchestra is under the personal direction of the violin instructor it is of a decided advantage to the violin students.

Ensemble. In this department, sonatas for piano, and violin by Bach, Beethoven, Mendelssohn, Schumann, Mozart, Hayden, Schubert, Grieg, Rubinstein and others are used; also many classical compositions of different forms. This department is open to advanced piano students only.

CALENDAR FOR 1915-1916.

The music department has devided the year into three terms of twelve weeks each, or if desired, lessons may be arranged by the college semester.

1915—September 13: Fall term registration begins.
December 4: Fall term closes.
December 6: Winter term begins.
1916—February 26: Winter term closes.
February 28: Spring term begins.
June 6: Spring term closes.

TUITION.

With Mr. McNeely.

For one forty-five minute lesson per week for one term.....$25.00
For two half-hour lessons per week for one term..... 32.00
Harmony, for the entire academic year (two lessons a week).... 20.00

With Miss Hartman.

For one forty-five minute lesson per week for one term.....$18.00
For two half-hour lessons per week for one term..... 22.00
Organ, one hour lesson per week for one term..... 24.00

With Mr. Bishop.

One thirty-minute lesson per week for one term.....$18.00
Two half-hour lessons per week for one term..... 36.00

With Mr. Jackson.

For one forty-five minute lesson per week for one term.....$18.00
For two half-hour lessons per week for one term 25.00
For one hour ensemble lesson per week for one term..... 18.00

Students wishing to arrange for vocal or instrumental instruction by the single lesson instead of by the term will be charged $1.50 per half-hour lesson.

Piano practice may be arranged for at the following prices:
One hour each day, 30 cents per week.
Organ practice: One hour each day, 25 cents.

Alumni

With Their Years, Degrees and Present Addresses and Occupations.

Alderson, Myrtle, B. S., 1913; Helena, Montana.

Allen, Elbert, B. S., 1903; Attorney at Law, Livingston, Mont.

Alward, Mary L., B. S., 1908; Teacher in Gallatin County High School, Bozeman, Montana.

Annin, James T., B. S., 1911; Part owner Columbus News, Columbus, Montana.

Baker, Florence, B. S., 1912; Deceased.

Baker, Harold E., B. E. E., 1907; Superintendent Electric Power Co., Naches, Washington.

Bancroft, Raymond E., B. S., 1911; Horticultural Inspector, Billings, Montana.

Barnard, Robert B., B. S., 1910; Salesman Westinghouse Electric Co., Butte, Montana.

Bell, James C., B. S., 1911; Superintendent McIntosh Orchard and Ranch Co., Darby, Mont.

Benton, Ralph, B. S., 1906; Associate Professor of Applied Biology, University of Southern California, Los Angeles.

Blessing, John, B. S., 1912; Horticulturist, Bitter Root Valley Orchard Company, Victor, Montana.

Bole, Margaret, B. S., 1913; Clerk, Bozeman Daily Chronicle office, Bozeman, Montana.

Bole, William S., B. S., 1906; Physician and Surgeon, Bozeman, Montana.

Booker, Clinton T., B. S., 1911; Superintendent Great Falls and Missouri River Substations Montana Power Company, Butte, Montana.

Blankenship, E. V., B. S., 1897; Farming and Stock Raising, Bozeman, Montana.

Brabrook, Ralph, B. S., 1913; Instrument Man, Office of Assistant City Engineer, Indianapolis, Indiana.

Brewer, Lucille, B. S., 1909; Graduate Student, University of Chicago, Chicago, Illinois.

Breneman, Annie T., B. S., 1907; Instructor in Mathematics, Teton County High School, Choteau, Montana.

Brook, Thomas B., B. S., 1913; Mechanician, Real Estate Company, Helena, Montana.

Brown, Archie S., B. S., 1910; Electric Expert United States Navy, Seattle, Washington.

Brown, Edith E., B. S., 1904; Mrs. John Milloy, Vancouver, B. C.

Buckley, Thomas W., B. S., 1914; Farmer, Manhattan, Montana.

Bull, Edna, B. S., 1909; Mrs. W. G. Kirscher, Townsend, Montana.

Bull, Frieda M., B. S., 1907; M. S., 1909; Instructor in Mathematics, Montana State College, Bozeman, Montana.

Burke, Edmund, B. S., 1907; Chemist and Meteorologist, Montana Agricultural Experiment Station, Bozeman, Montana.

Butter, Donald, B. S., 1909; Electrical Engineer General Electric Company, Schenectady, N. Y.

Caldwell, Thomas O., B. A. C., 1899; Leasing on Gold Reef and Maginnis Mine, Lewistown, Montana.

Carr, Irene H., B. S., 1911; Mrs. Claude Meserve, North Bridgetown, Maine.

Carmichael, Effie, B. S., 1910; Mrs. Vergil A. Spicer, Red Oak, Iowa.

Chaffee, Sarah, B. S., 1906; Mrs. Rudolph Beseke, Rathdrum, Idaho.

Clark, Ben A., B. S., 1911; Farmer, Springdale, Montana.

Clark, Grace, B. S., 1911; Los Angeles, California.

Clark, Olive, B. S., 1913; Bozeman, Montana.

Cockrel, Irvin, B. S., 1900; Osteopath Physician, New York City.

Collins, Walter E., B. S., 1902; Trust Officer, State Savings Bank and Practicing Attorney, Butte, Montana.

Cooke, Amy, B. S., 1908; Mrs. George Ambrose, Mackay, Idaho.

Cook, George, B. S., 1912; Farmer, Bozeman, Montana.

Cowan, Lewis, B. C. E., 1904; Civil Engineer, Bozeman, Montana.

Cullum, Georgia, B. S., 1914; Instructor in Home Science, Havre High School, Havre, Montana.

Dawes, Rhoda, B. S., 1913; Instructor in Home Science, Sweet Grass County High School, Big Timber, Montana.

Daly, Freeman A., B. S., 1912; Civil Engineer, Choteau, Montana.

Davidson, Mary E., B. S., 1910; In Settlement Work, Chicago, Illinois.

DeMuth, Maud S., B. S., 1907; Mrs. W. D. Tallman, Bozeman, Montana.

DeMuth, David R., B. S., 1910; Deceased.

Douglas, Stanley, B. S., 1913; Montana Power Company, Canyon Ferry, Montana.

Donaldson, Noble C., B. S., 1912; Assistant in Grain Investigation of U. S. Department of Agriculture, Moccasin, Montana.

Draper, Charles H., B. S., 1912; Editor Carbon County Journal, Red Lodge, Montana.

Driscoll, William J., B. S., 1908; Civil Engineer, Lawrence, Mass.

Dusenbury, Inez, B. S. 1912; Teacher, Rudyard, Montana.

Eckles, Mildred A., B. S., 1914; Instructor in Home Science, Thompson Falls, Mont.

Edsall, William, B. S., 1911; Switchboard Expert, Westinghouse Electric Co., New York City.

Edwards, Margaret, B. S., 1912; Instructor in Home Science, High School, Jacksonville, Florida.

Edwards, Timothy, B. S., 1909; Civil Engineer, Bozeman, Mont.

Ellis, Edward M., B. S., 1911; General Electric Company, Los Angeles, California.

Everett, Inez, B. S. 1914; Student University of Minnesota, Minneapolis, Minnesota.

Fisher, Charles M., B. S., 1908; Electrical Engineer, Washington Water Power Company, Spokane, Washington.

Fisher, Helen, B. S., 1910; Mrs. Fred Willson, Bozeman, Montana.

Flager, Harold J., B. E. E., 1907; Statistician for Puget Sound Traction, Light and Power Company, Seattle, Washington.

Flager, Howard A., B. E. E., 1906; Business, Mount Vernon, Washington.

Flager, Ruth, B. S., 1910; Mrs. Carl Widener, Bozeman, Montana.

Flaherty, Charles D., B. C. E., 1904; Engineer, Livingston, Montana.

Flanders, Clara M., B. S., 1914; Mrs. William Vestal, Bozeman, Montana.

Foster, Florence, B. S., 1896; Mrs. Burton Fleming, Iowa City, Iowa.

Fox, Hazel, B. S., 1910; Mrs. Byram Mayfield, Enterprise, Oregon.

Freeman, Beatrice, B. S., 1900; Mrs. Thomas S. Davis, Columbus, Mont.

Freeman, W. B., B. C. E., 1903; in charge of Irrigation and Drainage for the government of Siam.

Froebe, Frank J., B. S., 1911; Montana Power Co., Helena, Montana.

Gardiner, Henry C., B. S. A., 1903; Veterinarian and Agriculturist, Anaconda Copper Mining Company, Anaconda, Montana.

Gordon, Fred E., B. S., 1913; Assistant Manager Land Department, Anaconda Copper Mining Company, Anaconda, Montana.

Gottschalk, Carl, B. S., 1909; M. S., 1910; Assistant in Chemistry, Montana State College, Bozeman, Montana.

Griffith, Warren J., B. E. E., 1907; Spokane, Washington.

Hagerman, Edna, B. S., 1912; Instructor in Home Science, Great Falls, Montana.

Haines, Will T., B. S., 1911; Instructor in Electrical Engineering, Montana State College, Bozeman, Montana.

Hansen, Charles L., B. S., 1914; County Agriculturist, Missoula, Montana.

Ham, Frank W., B. S., 1903; M. S., 1905; Professor of Physics, Montana State College, Bozeman, Montana.

Hamilton, Everett A,. B. S., 1911; Chief Operator Madison River Power Co., Norris, Montana.

Harmon, Ella M., B. S., 1914; Instructor in Home Science, Dawson County High School, Glendive, Montana.

Hartman, Brooke, B. S., 1913; Bookkeeper, Empire Bank and Trust Company, Lewistown, Montana.

Hartman, June, B. S., 1910; Instructor in Music, Montana State College, Bozeman, Montana.

Hartman, Lois K., B. S., 1907; Quito, Ecuador.

Hartman, Ruth, B. S., 1913; Teacher of Music, Sheridan, Montana.

Hartman, Will., B. S., 1908; Crookes and Hartman, Engineers, Livingston, Montana.

Hawkins, P. H., M. S., 1903; Banker, Absarokee, Montana.

Heighton, Pearl A., B. S., 1914; Instructor in Home Science, Gallatin County High School, Bozeman, Montana.

Henderson, Charles F., B. S., 1910; Westinghouse Electric Company, Pittsburg, Pennsylvania.

Henderson, Lisle, B. S., 1909; Electrical Engineer, Montana Reservoir and Irrigation Company, Helena, Montana.

Higgins, Lucille, B. S., 1911; M. S. 1912; Mrs. C. S. Norton, Jr., Bozeman, Montana.

Hill, Lewis L., B. S., 1914; Civil Engineer, Livingston, Montana.

Hind, Bert S., B. S., 1909; Superintendent Power Plant, Madison River Power Company, Norris, Montana.

Hinman, Ruth, B. S., 1912; Teacher, Three Forks, Montana.

Hodgskiss, John E., B. S., 1912; M. S., 1913; Farmer, Choteau, Montana.

Hodgskiss, William L., B. S., 1914; Manager of Ranch, Choteau, Montana.

Hutton, Fred, B. E. E., 1902; Deceased.

Jacobs, Jillian, B. S., 1910; Mrs. Arie DeGroot, Three Forks, Montana.

James, John S., B. S., 1909; Engineer, Montana Reservoir and Irrigation Company, Cascade, Montana.

Jones, Burle J., B. S., 1904; Manager Orangewood Nursery Company, Phoenix, Arizona.

Jones, Kyle, B. S., 1912; Rancher, Bozeman, Montana.

Jones, Wyatt Wagner, B. S., 1901; M. S., 1902; Plant Pathologist, Investigating Smelter Smoke, Salt Lake City, Utah.

Kenck, Max W., B. S., 1914; Homesteader, Silver Bow, Montana.

Kennedy, Cyril C., B. S., 1910; Power Plant Operator, Great Falls Power Company, Great Falls, Montana.

Kiefer, James A., B. S., 1914; Assistant in Physics and Graduate Student, Montana State College, Bozeman, Montana.

Kimpton, Addie, B. S., 1910; Mrs. James H. Conrad, Toston, Montana.

King, Lowell, B. S., 1904; Construction Engineer, Electric Railroad, Davenport, Iowa.

King, Ruby E., B. S., 1909; Mrs. George Hogan, Bozeman, Montana.

King, Willard V., B. S., 1911; Entomological Assistant, United States Bureau of Entomology; Spotted Fever Tick Investigation, Florence, Montana.

Kinney, Edward C., B. C. E., 1907; Superintendent of Construction, United States Indian Service, Ganado, Arizona.

Kirk, Grace, B. S., 1911; Instructor in Home Science, Bozeman Public Schools, Bozeman, Montana.

Kirk, Mary E., B. S., 1906; Mrs. Ermine Potter, Corvallis, Oregon.

Kirscher, W. Guy, B. S., 1909; County Surveyor, Broadwater County, Townsend, Montana.

Koch, Elers, B. S., 1901; Supervisor Forest Service, Missoula, Montana.

Kremer, William J., B. S., 1910; General Manager Pine View Irrigation Company, Ennis, Montana.

Lamme, Maurice A., B. S., 1903; Director of Geology and Mineralogy, Government University, Montevideo, Uruguay, S. A.

Lannin, Earl A., B. S., 1912; Electrical Engineer, Montana Power Company, Lewistown, Montana.

Leinard, Ford B., B. S., 1914; Homesteader, Edwards, Montana.

Lewis, Edna, B. S., 1903; Instructor in Mathematics, Gallatin County High School, and Member of County Board of Examiners, Bozeman, Montana.

Livingston, Walter, B. S., 1910; Farmer, Clyde Park, Montana.

Locke, Jerome G., B. C. E., 1908; C. E., 1910; President and General Manager of Livingston Publishing Company, Livingston, Montana.

Lorentz, Floyd S., B. E. E., 1907; E. E., 1910; Rancher, Coffee Creek, Montana.

Luther, J. Glenn, B. S., 1912; Electrical Engineer, Conrey Placer Mining Company, Ruby, Montana.

Mackay, Warren, B. S., 1913; Draughtsman, Anaconda Copper Mining Company, Anaconda, Montana.

Martin, C. A., B. S., 1914; Civil Engineer, Great Northern Railway, Havre, Montana.

Maynard, Edna, B. S., 1900; M. S., 1903; Mrs. Garfield T. Morris, San Francisco, California.

McCraw, John L., B. S., 1912; Deceased.

Metheney, Blanche, B. S., 1911; Demonstrator Montana Power Company, Billings, Montana.

Millegan, Guy J., B. S., 1912; Farmer and Stockgrower, Millegan, Montana.

Millegan, Homer D., B. S., 1914; Farmer and Stockgrower, Millegan, Montana.

Montforton, Zoe, B. S., 1901; Mrs. Dr. H. C. Patterson, National City, California.

Moore, Ellie J., B. S., 1901; Farmer, Bozeman, Montana.

Morgan, George W., B. S., 1912; Assistant in Plant Physiology, Bureau of Plant Industry, Huntley, Montana.

Morgan, Joseph D., B. S., 1912; Assistant in State Grain Laboratory, Bozeman, Montana.

Morgan, Oliver P., B. S., 1896; Deceased.

Morris, Ellwood, B. S., 1909; Assistant Botanist and Bacteriologist, Montana Agricultural Experiment Station, Bozeman, Montana.

Morris, Garfield T., B. C. E., 1903; Senior Civil Engineer in the Valuation Department, Interstate Commerce Commission, Pacific Division, San Francisco, California.

Mountjoy, Agnes, B. S., 1907; Mrs. Harry Mickelson, Opheim, Montana.

Mountjoy, Irvin, B. E. E., 1908; Homesteader, Cardwell, Montana.

Nash, Lewis, B. S., 1904; Farmer, Clyde Park, Montana.

Noble, Erma, B. S., 1909; M. S., 1910; Teacher, Broadwater County High School, Townsend, Montana.

Osborne, Belle, B. S., 1907; Mrs. D. E. Fish, Mount Pleasant, Iowa.

Pease, Jay L., B. C. E., 1907; Farmer, Bozeman, Montana.

Peck, Harry L., B. S., 1911; Garneill, Montana.
Penwell, Clyde C., B. S., 1906; B. E. E., 1907; Homesteader, Edwards, Montana.
Penwell, Clyde W., B. E. E., 1909; Montana Power Co., Great Falls, Montana.
Peters, Orville S., B. S., 1909; E. E., 1912; Assistant Physicist, Bureau of Standards, Washington, D. C.
Peterson, James A., B. S., 1909; Attorney at Law, St. Paul, Minnesota.
Philpott, June, B. S., 1911; M. S., 1912; Teacher, Yamhill, Oregon.
Piedalue, Irene, B. S., 1911; Instructor in Home Science, Lewistown, Montana.
Piedalue, Laura, B. S., 1912; Instructor in Home Science, Helena High School, Helena, Montana.
Pool, Louis K., B. S., 1910; City Engineer, Townsend, Montana.
Potter, Ermine L., B. S., 1906; Professor Animal Husbandry, Oregon Agricultural College, Corvallis, Oregon.
Quaw, Eugene C., B. S., 1911; Playwright, Bozeman, Montana.
Quaw, Lucille, B. S., 1903; Instructor in Gallatin County High School, Bozeman, Montana.
Quaw, Mignon, B. S., 1902; Private Secretary, Law Office, Los Angeles, California.
Quaw, Thomas B., B. S. 1907; Instructor in Chemistry, Carbon county High School, Red Lodge, Montana.
Reese, Herbert J., B. S., 1904; Chemist, Long Beach, California.
Richter, Frederick A., B. S., 1914; With Madison Gas and Electric Company, Madison, Wis.
Robinson, J. W., B. S., 1908; Grain Buyer for McCaull-Dinsmore Co., Bozeman, Montana.
Roecher, Rausie, B. S., 1914; Instructor in Home Science, Gallatin County High School, Bozeman, Montana.
Sacket, Nathalie, B. S., 1913; Secretary, Public Highway Commission, Helena, Montana.
Sacket, Charles T., B. C. E., 1904; C. E., 1907; Consulting Civil Engineer, Livingston, Montana.
Sales, Reno H., B. S., 1898; Geologist, Anaconda Copper Co., Butte, Montana.
Schabarker, W. W., B. M. E., 1902; Night Foreman, Shops, Milwaukee R. R., Milwaukee, Wisconsin.
Schmidt, F. W., B. S., 1903; Mining Engineer, Sao Paulo, Brazil, S. A.
Schumacher, F. W., B. S., 1914; Brogem, Oregon.
Seamans, Arthur, B. S., 1913; Assistant Superintendent United States Field Station, Akron, Colorado.
Shaw, W. T., B. S., 1896; Unknown.
Shovell, William L., B. S., 1912; Horticultural Expert, Bitter Root Irrigation Company, Hamilton, Montana.
Sloan, J. Harvey., B. C. E., 1903; Public Service Commission, Madison, Wisconsin.

Sloan, W. F., B. E. E., 1903; Consulting Engineer, Madison Wisconsin.
Sloan, William Glenn., B. S., 1910; Government Drainage Engineer, Boise, Idaho.
Smith, Alda, B. S., 1913; Instructor in Home Economics, Montana State College, Bozeman, Montana.
Snider, Leta, B. S., 1911; Mrs. James A. Peterson, St. Paul, Minn.
Solberg, Selmer H., B. S., 1914; In Business, Big Timber, Mont.
Soper, Joseph, B. S., 1913; San Diego, California.
Spain, Marvin, B. S., 1911; Homesteader, Sand Springs, Montana.
Spain, Whitfield, B. S., 1909; Manager of ranch, Belgrade, Montana.
Spragg, Frank A., B. S. A., 1902; Plant Breeder of Farm Crops for the Michigan Experiment Station, Lansing, Michigan.
Stafford, Lucy B., B. S., 1896; Mrs. William Peck, Pony, Montana.
Switzer, Phyllis Madge, B. S., 1914; Dietitian, St. Peter's Hospital, Helena, Montana.
Taylor, John C., B. S., 1912; County Agriculturist, Wibaux, Montana.
Tavener, Frank C., B. C. E., 1903; Construction Engineer, Montpelier, Idaho.
Thompson, Homer C., B. S., 1902; Principal of High and Grade Schools, Three Forks, Montana.
Thorpe, Mabel A., B. S., 1907; Mrs. J. A. Thaler, Bozeman, Montana.
Thorpe, Elizabeth, B. S., 1907; Homesteader, Salesville, Montana.
Tracy, Edna, B. S., 1908; Mrs. John White, Bozeman, Montana.
Tremper, William G., B. S., 1911; Homesteader, Baylor, Mont.
Truman, Joseph K., B. S., 1913; Bozeman, Montana.
Vestal, William B., B. S., 1914; In City Engineer's Office, Bozeman, Montana.
Vreeland, Edna, B. S., 1909; Shay's Cafeteria, Los Angeles, California.
Wade, Arthur M., B. S., 1911; Fireman, Milwaukee Railroad, Three Forks, Montana.
Walchli, Fred, B. S., 1910; Mechanical Engineer, Kalispell, Montana.
Webster, Alden, B. S., 1914; Electrical Draftsman, Corps of Engineers, United States Army, Washington, D. C.
Widener, Carl C., B. S., 1908; City Engineer, Bozeman, Montana.
Wharton, John C., B. S., 1913; Stock Business, Wisdom, Montana.
Willey, Leroy, B. S., 1913; Dry Land Office, U. S. Department of Agriculture, Washington, D. C.
Williams, Frank B., B. M. E.; Engineer, State School for Deaf and Blind, Boulder, Montana.
Williams, Lee, B. E. E., 1902; County Surveyor, Powell County and City Engineer, Deer Lodge, Montana.
Williams, Roy B., B. S., 1911; Civil Engineer, Bozeman, Montana.
Williams, Sidney A., B. S., 1911; Westinghouse Electric Company, Wilkinsburg, Pa.
Wilson, Elva, B. S., 1909; Teacher, Three Forks, Montana.
Wilson, Walter, B. S., 1913; Westinghouse Electric Company, Pittsburg, Pennsylvania.

Wolpert, Harold E., B. S., 1912; Working in Smelter, Mullen, Idaho.
Wylie, Lawrence, B. S., 1913; Cincinnati, Traction Company, Winton Place, Ohio.
Wylie, Mary, B. S., 1910; Teacher, Great Falls, Montana.

SCHOOL OF MUSIC GRADUATES.

Alexander, Maud, Piano, 1913, Student, M. S. C.....Bozeman, Mont.
Alward, Coda, Piano, 1908.....Polson, Mont.
Bancroft, Alma J., Piano, 1911, Mrs. Roy Strohm ..Bozeman, Mont.
Benge, Faith, Piano, 1910.....Winterset, Iowa.
Brown, Edith, Piano, 1906, Mrs. John Milloy Regina, Canada.
Featherston, Ellis, Piano, 1907, Music Supervisor.....Mattewan, N. Y.
Freeman, Lorraine, Piano, 1906, Teacher..... Great Falls, Mont.
Griffin, Grace, Piano, 1907, Mrs. W. C. Blythe.....Whittier, Cal.
Griffith, Gladys, M., Piano, 1913, Student.....Minneapolis, Minn.
Hartman, Flora, Piano, 1907, Teacher.....Bozeman, Mont.
Hartman, June, Piano, 1910; Teacher, M. S. C.....Bozeman, Mont.
Hartman, Ruth, Piano, 1913, Teacher Sheridan, Mont.
Hollier, Georgia, Piano, 1912; Student.....Bozeman, Mont.
Lovelace, Amy, Vocal, 1908, Mrs. Geo. Rittenhouse.....Williams, Ariz.
Maynard, Frances, Piano, 1909, Mrs. Ed. Howard.....Bozeman, Mont.
Piedalue, Alice, Piano, 1908, Mrs. C. W. Hancock....Lewistown, Mont.
Stanton, Grace, Piano, 1901, Mrs. W. B. Walker.....Missoula, Mont.
Sales, Zada, Piano, 1912, Student.....Bozeman, Mont.
Schumacher, Hettie, Piano, 1912, Teacher.....Bozeman, Mont.
Waters, Mary, Piano, 1902, Mrs. H. L. Huston, Teacher..Helena, Mont.
Widener, Carl, Vocal, 1908; City Engineer.....Bozeman, Mont.
Work, Vida, Piano, 1909, Mrs. Ray Holloway.....Bozeman, Mont.

Degrees Granted June, 1914

ELECTRICAL ENGINEER

Edsall, William S., ... Electrical Engineer

BACHELOR OF SCIENCE

Buckley, Thomas W. Civil Engineering
Cullum, Georgia May Home Economics
Eckels, Mildred A. Home Economics
Everett, Inez Home Economics
Flanders, Clara M. Home Economics
Hodgkiss, William Lawrence Agronomy
Heighton, Pearl A. Home Economics
Harmon, Ella May Home Economics
Hansen, Charles L. Agronomy
Hill, Lewis L. Civil Engineering
Kiefer, James A. Mathematics
Kenck, Max William Electrical Engineering
Leinard, Ford B. Agronomy
Millegan, Homer Dwight Animal Industry
Martin, Claude Augustus Civil Engineering
Richter, Frederick August Economics and Engineering
Roecher, Rausie Home Economics
Schumacher, F. Wilbur Agronomy
Switzer, Phyllis Marguerite Home Economics
Solberg, Selmer H. Electrical Engineering
Vestal, William Baxter, Jr. Civil Engineering
Webster, R. Alden Electrical Engineering

MUSIC.

Diploma.

Alexander, Maud Bozeman
Hartman, Leah Bozeman
Kirschner, Hortense Bozeman
Thorpe, Florence Bozeman

Names of Students, 1914-15

Post Graduates.

Bennion, Fred	Animal Industry	Salt Lake City
Chase, Mary E.	Irregular	Bluehill, Maine
Ellis, Edward	Electrical Engineering	Los Angeles
Kiefer, James	Irregular	Bozeman
Romney, Otto G.	Animal Industry	Salt Lake City
Smith, Inez M.	Home Economics	Bozeman
Wells, Roscoe	Biology	Bozeman

Seniors.

Abell, Tracy	Horticulture	Bozeman
Batch, Otto	Animal Industry	Helena
Burkett, Alonzo	Chemistry	Bozeman
Brooks, Roland	Animal Industry	Chrisman, Ill.
Border, J. Ernest	Animal Industry	Bozeman
Coffey, Hazel	Home Economics	Bozeman
Davidson, Lyndall	Chemistry	Bozeman
Dahl, Hilmer	Mechanical Engineering	Belt
Eberle, Alfred	Agronomy	Butte
Fowler, Viola	Secretarial	Bozeman
Fiske, John	Electrical Engineering	Helena
Goodson, Anna	Home Economics	Livingston
Gray, Florence	Math-Physics	Bozeman
Gray, Charles	Animal Industry	Chouteau
Grimes, Walter	Civil Engineering	Bozeman
Hollier, Georgia	Secretarial	Bozeman
Homann, Fred	Mechanical Engineering	Bozeman
Jacobs, Edward	Electrical Engineering	Delta, Colo.
J nes, Ray S.	Chemistry	Livingston
Kelley, Robert T.	Civil Engineering	Anaconda
Kennard, Eveleen	Home Economics	Kinsey
Lott, Mortimer J.	Animal Industry	Twin Bridges
Myers, Ada Mae	Home Economics	Billings
Malsor, Roy E.	Civil Engineering	Anaconda
Morgan, Carl F.	Civil Engineering	Joliet
Noble, Edward G.	Animal Industry	Whitehall
Pettigrew, Leslie	Civil Engineering	Great Falls
Potter, John V.	Elec. Engineering	White Sul. Spgs.
Piedalue, Aimee	Secretarial	Bozeman
Pool, Florence	Home Economics	Townsend
Papke, William C.	Civil Engineering	Bozeman
Steel, Hamilton	Electrical Engineering	Great Falls
Truitt, Chas. A.	Civil Engineering	Bozeman
Taylor, Emma	Home Economics	Bozeman
Thompson, Paul	Chemistry	Bozeman

Wilcomb, Maxwell	Civil Engineering	Twin Bridges
Wilson, Kathleen	Home Economics	Bozeman
Whipple, Chas. A.	Animal Industry	Helena

Juniors.

Alexander, Maud	Secretarial	Bozeman
Allen, Mollie J.	Home Economics	Butte
Borthwick, Alberta	Home Economics	Hamar, N. D.
Cooley, Esther B.	Home Economics	Bozeman
Cotner, Victor	Civil Engineering	Lowell, Wyo.
Chestnut, Lulu	Home Economics	Havre
Carr, Myron	Animal Industry	Bozeman
Clarkson, Robert	Animal Industry	Chinook
Ford, Arthur	Mechanical Engineering	Helena
Fletcher, Elizabeth	Home Economics	Bozeman
Heageny, William	Agronomy	Bozeman
Kinsella, Olive	Home Economics	Bozeman
Kelly, Jeanette	Home Economics	Deer Lodge
Kelly, Martin	Civil Engineering	Anaconda
Lescher, Taylor	Electrical Engineering	Great Falls
Lessel, Erma	Chemistry	Butte
Mills, Gwendolyn	Home Economics	Helena
Milburn, George R.	Civil Engineering	Butte
Miller, Oscar	Electrical Engineering	Jeffers
Miewald, Ethel	Home Economics	Chinook
Nordquist, Clark	Agriculture	Bozeman
Osenbrug, Albert	Agronomy	Butte
O'Connor, William	Animal Industry	Red Lodge
Riddell, Marsa	Home Economics	Helena
Stadler, Marie H.	Chemistry	Helena
Swenson, Hilve	Home Economics	Kasota, Minn.
Stanley, Amelia	Home Economics	Great Falls
Sweat, Ruth	Home Economics	Great Falls
Seamans, Howard	Biology	Wauwatosa, Wis.
Steel, David A.	Civil Engineering	Great Falls
Tubbs, Palmer	Civil Engineering	Elkhorn, Wis.
Wight, Florence	Secretarial	White Sulphur Springs
Walker, Cecil	Home Economics	Bozeman

Sophomores.

Beerstecher, Ada	Home Economics	Belgrade
Bunnell, Ercell	Mechanical Engineering	Bozeman
Bullock, Fred	Agriculture	Bozeman
Bowlen, Raymond	Agriculture	Red Lodge
Bennetts, John C.	Electrical Engineering	Butte
Carpenter, Ethel	Home Economics	Great Falls
Cannon, Raymond	Agriculture	Bozeman
Clark, May	Home Economics	Bozeman
Cooley, George A.	Agriculture	Bozeman

Cole, E. Lester	Agriculture	Butte
Cook, Charles W.	Civil Engineering	Roundup
Cook, Donald	Chemistry	White Sulphur Springs
Christensen, Anker	Mech. Engineering	Lancaster, Wash.
Crittenden, Floyd	Agriculture	Bozeman
DeCamp, Renan	Electrical Engineering	Helena
Duquette, Jay	Electrical Engineering	Potomac
Fox, Arthur P.	Agriculture	Kalispell
Fowler, Edith	Home Economics	Great Falls
Gatton, Cyrus J.	Agriculture	Bozeman
Garvin, John	Electrical Engineering	Helena
Havens, Donnell	Chemical Engineering	Chinook
Hodgskiss, Ursula	Home Economics	Choteau
Ingram, C. Craig	Electrical Engineering	Helena
Jackson, Joel C.	Agriculture	Harrison
Johnson, Albion	Chemical Engineering	Great Falls
Jorgenson, Ralph	Agriculture	Fox
Jaeckel, Carl G.	Agriculture	Anaconda
Jackman, E. Russell	Agriculture	Kalispell
Jolley, Lewis	Architectural Engineering	Bozeman
Kinsella, Thomas	Chemistry	Bozeman
Kirk, Marguerite	Secretarial	Bozeman
Kneale, Morris T.	Civil Engineering	Bergen, N. Y.
Kountz, Josephine	Home Economics	Bozeman
Kretlow, Mary	Home Economics	Helena
Kirschner, Hortense	Secretarial	Bozeman
Lund, Janelle	Chemistry	Bozeman
Luther, Edith	Chemistry	Choteau
Langohr, Don	Biology	Bozeman
Linfield, Bertil	Agriculture	Bozeman
Ladenburg, Carl	Electrical Engineering,	Columbia Falls
Monson, William	Civil Engineering	Ovando
Manning, J. Whitney	Agriculture	Great Falls
McIver, Grace	Secretarial	Great Falls
McSpadden, Everett	Agriculture	Missoula
Merrigold, March	Applied Art	Kalispell
Milnor, Estelle	Chemistry	Troy
Mitchell, Ruth	Secretarial	Bozeman
Noble, Ruth	Secretarial	Great Falls
Noble, Mary V.	Home Economics	Whitehall
Orvis, Worth	Agriculture	Salesville
Perring, Maude	Home Economics	Salesville
Rapatz, Eugene	Electrical Engineering	Havre
Rice, Hubert	Civil Engineering	Kalispell
Ronne, Edwin	Electrical Engineering	Chinook
Saltz, Lawrence	Agriculture	Dundee, Mich.
Stewart, Mildred	Chemistry	Bozeman
Strand, Roy	Agriculture	Helena
Scott, Parke F.	Agriculture	Armstead
Stahlford, Ruby	Home Economics	Hamilton
Snow, Manfred	Agriculture	Kalispell
Scholten, Henry	Mechanical Engineering	Big Timber

Slavens, Opal	Home Economics	Stickley
Truman, Ida	Home Economics	Bozeman
Taylor, Radford	Agriculture	Bozeman
Thomas, David	Civil Engineering	Great Falls
Undem, Louis	Agriculture	Chicago, Ill.
Whiteside, John	Electrical Engineering	Kalispell

Freshmen.

Abrahamson, Irene	Home Economics	Red Lodge
Armstrong, Nina	Secretarial	Big Timber
Arneson, Elmer	Electrical Engineering	Big Timber
Arneson, Hattie	Secretarial	Big Timber
Brown, Helen	Secretarial	Sauk Center, Minn.
Borton, Albert	Agriculture	Glasgow
Borton, Carl D.	Civil Engineering	Glasgow
Burke, John J.	Electrical Engineering	Butte
Babbitt, Minnie	Home Economics	Victor
Border, Blanche	Home Economics	Bozeman
Bay, Russell	Electrical Engineering	Corvallis
Baker, Harold	Electrical Engineering	Manhattan
Brechbill, Walter	Electrical Engineering	Chinook
Bowlen, Wayne F.	Mechanical Engineering	Red Lodge
Bresee, T. F.	Chemical Engineering	Stevensville
Crowell, Roscoe	Electrical Engineering	Pony
Covert, Judson	Agriculture	Billings
Collett, John	Secretarial	Livingston
Carpino, Mary	Home Economics	Butte
Campanella, Tessie	Secretarial	Livingston
Crail, Lillian	Applied Art	Bozeman
Chattin, Earl	Agriculture	Missoula
Corkins, Clifford	Agriculture	Joliet
Carson, Simeon	Electrical Engineering	Boulder
Collins, Kinsey	Agriculture	Dillon
Cannon, Marjorie	Secretarial	Bozeman
Cannon, Vera	Secretarial	Bozeman
Caine, Leo R.	Electrical Engineering	Harlowton
Cummings, Ruth	Home Economics	Billings
Darrow, Vivian	Home Economics	Laurel
Dickson, Harold	Agriculture	Dillon
Drummond, Warren	Mechanical Engineering	E. Helena
Danielson, Mary	Home Economics	Miles City
Elliott, Mae A.	Secretarial	Roundup
Erwin, Kent	Mechanical Engineering	Bozeman
Erwin, Mae	Home Economics	Bozeman
Flood, Marie	Home Economics	Park City
Finlay, William	Agriculture	Bozeman
Ford, Albert D.	Mechanical Engineering	Bozeman
Gatton, Walter C.	Biology	Bozeman
Gray, Helen	Home Economics	Bozeman
Gray, W. David	Secretarial	Bozeman

Glass, E. R.	Electrical Engineering,	Waverly, Kan.
Hollier, Samuel	Mechanical Engineering	Bozeman
Holt, Clarence C.	Agriculture	Stevensville
Hodgskiss, Ruby	Home Economics	Choteau
Haller, Beulah	Home Economics	Butte
Hartley, Thos. J.	Secretarial	New Albin, Iowa
Hewett, Florence	Home Economics	Billings
Hall, Medra	Home Economics	Bozeman
Hines, John L.	Agriculture	Bozeman
Hagen, Roy C.	Electrical Engineering	Great Falls
Hastings, John L.	Electrical Engineering	Joliet
Helstrom, Carl	Civil Engineering	Anaconda
Hubbard, George	Civil Engineering	Billings
Johnson, Arne G.	Agriculture	Butte
Johnson, Martha	Home Economics	Clancey
Judevine, Harriet	Applied Art	Bozeman
Kelly, Raymond W.	Civil Engineering	Billings
Kelly, Jean D.	Agriculture	Anaconda
Kuhns, Myrtle	Home Economics	Kalispell
Kuhns, Raymond	Civil Engineering	Kalispell
Langford, Mildred	Home Economics	Sterling, Ill.
Luce, Lewellyn	Secretarial	Bozeman
Langohr, Margaret L.	Home Economics	Bozeman
Legge, Roy W.	Electrical Engineering	Gosport, Ind.
Lund, Helen	Applied Art	Bozeman
Minar, John W.	Electrical Engineering	Fort Benton
Manley, Frances	Secretarial	Butte
McDonnell, Annie	Home Economics	Bozeman
McCone, Alice	Home Economics	Burns
McCabe, John	Electrical Engineering	Kalispell
Miller, Joseph	Secretarial	Chinook
Muntzer, Henry	Electrical Engineering	Butte
Nye, Paul R.	Agriculture	Billings
Noble, Florence	Applied Art	Bozeman
O'Connor, Frank J.	Agriculture	Red Lodge
Papke, Emil	Electrical Engineering	Bozeman
Pippinger, Harold	Electrical Engineering	Glasgow
Pippy, Elizabeth	Home Economics	Shelby
Parham, Champlin	Agriculture	Billings
Preston, Edward C.	Electrical Engineering	Stevensville
Pope, Alger	Mechanical Engineering	Bozeman
Park, Lee	Civil Engineering	Bozeman
Quaw, Marjorie	Applied Art	Bozeman
Rowe, Mary	Secretarial	Victor
Robinson, Ernest	Biology	Moore
Ross, Thomas A.	Agriculture	Ada
Robinson, Roy W.	Electrical Engineering	Hamilton
Roberts, Otto	Electrical Engineering	Salesville
Ribelin, Carter	Electrical Engineering	Polson
Shannon, Evelyn	Secretarial	Lewistown
Sales, Zada	Secretarial	Bozeman
Streets, Rupert	Agriculture	Helena

Sweat, Jack	Agriculture	Great Falls
Stranahan, Clinton	Electrical Engineering	Fort Benton
Swan, Ulmont	Mechanical Engineering	Butte
Sewell, Gordon	Mechanical Engineering	Anaconda
Shaw, R. C.	Secretarial	Livingston
Scott, Samuel	Mechanical Engineering	Butte
Todd, Grant W.	Elec. Engin'ing, Sedro Woolley, Wash.	
Todd, William W.	Secretarial	Sedro Woolley, Wash.
Talgo, Laura	Secretarial	Billings
Thien, Edmund K.	Civil Engineering	Ryegate
Thompson, W. Talbot	Agriculture	Bozeman
Thomas, John C.	Mechanical Engineering	Billings
Van Eman, Dorothy	Applied Art	Gilman
Woolridge, E. Francis	Agriculture	Chinook
Watters, Lawrence	Agriculture	Victor
Werre, Harold W.	Biology	Bozeman
Wallace, Fred P.	Secretarial	Bozeman
Walker, J. Paul	Civil Engineering	Bozeman
Wylie, Eleanor	Secretarial	Bozeman
Ziebrath, Dorothy	Secretarial	Chinook

Irregulars.

Atkinson, Mrs. Barbara	Bozeman
Ailinger, Lola	Denver, Colorado
Braten, Sigrid	Bozeman
Brulo, William	Helena
Burckes, Louise	Bozeman
Clark, Florence	Salt Lake City
Donaldson, Jessie L.	Bozeman
Drake, P. J.	Helena
Fisher, John L.	Bozeman
Gottschalk, Mrs. Carl	Bozeman
Johannes, Mrs. R. J.	Bozeman
Malloy, E. E.	Helena
McKinney, Eva	Bozeman
MacDonald, Epheretta,	Bozeman
Pinckney, Reuben	Bozeman
Quinn, R. J.	Bozeman
Riley, Mrs. E. H.	Bozeman
Robinson, Mrs. Wilbur	Bozeman
Stiff, Gertrude	Bozeman
Smith, Richard	Helena
Travers, Jack	Black Rock, Utah
Wilson, Mrs. R. O.	Bozeman
Whitcomb, Mrs. W. O.	Bozeman

SECONDARY STUDENTS

Fourth Year.

Harris, Earl	Mechanic Arts	East Helena
Kammerer, Sophia	Home Economics	Bozeman
McLaughlin, Lorene	Home Economics	Helena
Stone, Frank	Mechanic Arts	Bozeman
Stone, Parker	Mechanic Arts	Bozeman
Stone, Louise	Home Economics	Bozeman

Third Year

Badgley, Jerome	Mechanic Arts	Bozeman
Beach, Ben	Mechanic Arts	Mitchell
Calkins, Walter S.	Mechanic Arts	Butte
Callahan, Eugene	Mechanic Arts	Bozeman
Limbert, Emmet	Mechanic Arts	Two Dot
Murray, Henry	Mechanic Arts	Hobson
Murray, Joseph	Mechanic Arts	Hobson
Ravet, John	Mechanic Arts	Bozeman
Roubideaux, Llewellyn	Mechanic Arts	Fort Hall, Ida.
Tobey, Willard	Mechanic Arts	Highwood
Woodward, Otto	Mechanic Arts	Willow Creek
Volquardsen, Henry	Mechanic Arts	Nissenshoern, Germany

Second Year.

Anderson, Hazel	Home Economics	Livingston
Axtell, Lillian	Home Economics	Bozeman
Berry, Robert	Mechanic Arts	Basin
Burns, James P.	Mechanic Arts	Bozeman
Burggraff, Mary	Home Economics	Stearns
Corbly, Gladys	Home Economics	Bozeman
Edwards, Fay	Mechanic Arts	Sheridan
Holgate, Alma	Home Economics	Manhattan
Jenkins, Fred	Mechanic Arts	Twin Bridges
Kaiser, Margaret	Home Economics	Wilsall
Lehfeldt, Martha	Home Economics	Broadview
Lorentz, Lyndon	Mechanic Arts	Toston
McKee, Anna M.	Home Economics	Jeffers
Sandburg, Harold	Mechanic Arts	Collins
Schekenbach, Frank	Mechanic Arts	Manhattan
Sparrow, Mary	Home Economics	Bozeman
Thibaudeau, Mary	Home Economics	Chinook
Walter, Eleanor	Home Economics	Sheridan
Young, Beatrice	Home Economics	Columbus

First Year.

Allen, Ross	Mechanic Arts	Fort Benton
Coulston, William	Mechanic Arts	Bozeman
Clark, William	Mechanic Arts	Chance

Ditty, Ethel	Home Economics	Lewistown
Givens, Loretta	Home Economics	Truly
Gilman, Vergle	Mechanic Arts	Bozeman
Halstead, Beebe	Mechanic Arts	Ashland
Haight, Elgar	Mechanic Arts	Peterson, Iowa
Hoyem, George	Mechanic Arts	Three Forks
Johnson, Jessie M.	Home Economics	Belt
Kimm, Trinia	Home Economics	Manhattan
McCarthy, Joe	Mechanic Arts	Canton
McKee, Archie	Mechanic Arts	Bozeman
Menzelkoch, Wesley	Mechanic Arts	Norris
Miller, Carrie	Home Economics	Choteau
Noble, Dorothy	Home Economics	Great Falls
Omta, Anna	Home Economics	Bozeman
Ohlin, Enoch	Mechanic Arts	Huntley
Roades, Edward A.	Mechanic Arts	Bozeman
Ross, Chas. F.	Mechanic Arts	Moorhead
Reinig, Alma	Home Economics	Wolf Creek
Reel, Cecil	Mechanic Arts	Bozeman
Reese, Marguerite	Home Economics	Bozeman
Roobol, Cornelia	Home Economics	Bozeman
Rinehart, Jessie	Home Economics	Dixon
White, Ruth B.	Home Economics	Manhattan
White, Jessie	Home Economics	Manhattan
Wood, Helen	Home Economics	Glendive

SCHOOL OF AGRICULTURE

Third Year.

Dehler, August	Helena
Fluhr, William	Helena
Gray, Robert K.	Choteau
Murray, John A.	Hobson
Selleck, Thos. J.	Roscoe
Starz, Oscar	Helena

Second Year.

Brewster, Warren	Birney
Hodgson, Wm. H.	Kalispell
Joughin, Neil,	Libby
Kennedy, Jesse	Harlem
Lull, John S.	Summit, S. D.
Maier, Richard	Reichle
Marks, Alfred	Clancy
Richardson, Giles B.	Bozeman
Rowland, Arthur	Bynum
Sullivan, Frank	Stevensville
Tow, Clarence	Box Elder
Tow, Raymond	Box Elder

Van Essen, Cornelius Stevensville
Ward, Earl Salesville
Wohlfrom, Burdette Canyon Creek

First Year.

Ackerly, Stewart Coffee Creek
Bernstein, Maurice Chicago, Ill.
Benson, Albert Stevensville
Beldon, Harold Utica
Blickensderfer, John Wills, N. D.
Bokma, Peter Conrad
Bompart, Reuben Helena
Brady, Milton Bozeman
Bradshaw, Ollie Knowlton
Bradshaw, Joe Knowlton
Brown, Donald Jefferson City
Buker, Albert Victor
Bernier, Arthur, ... Hogan
Budd, Fred Whitehall
Briggs, Jay Victor
Budde, Herman Great Falls
Burgraff, Adolph P. Stearns
Carpenter, Chester Clyde Park
Cockrell, Beverly San Jose, Cal.
Collett, George D. Bozeman
Commings, W. E., ... Livingston
Lellinger, Arthur Altamount, N. C.
Edwards, George Monarch
Eberl, John W. Clemens
Farnum, Guy E. Miles City
Foote, D. L. Orderville, Utah
Grimes, T. W. Helena
Hardgrove, Rennie Bozeman
Hardgrove, Ray Bozeman
Hardgrove, Roy Bozeman
Heare, Olga Red Lodge
Heare, Van Red Lodge
Hilditch, Edwin Scranton, Pa.
Hoffman, Peter Bozeman
Hopkins, J. A. H. Morristown, N. J.
Hosbrouch, Everett Sheridan, Wyo.
Hummel, Stanley Cleveland, Ohio
Hackett, Edward Victor
Junkermier, Oscar C. Belt
Lay, Harvey T. Reed Point
LaChapelle, Ulric Hogan
Lea, Wesley Stevensville
Lombard, Charles H. Missoula
Lichtwardt, Barty Helena
Martin, Donald Spencer, Iowa
McNeil, Lester Kirby

Metzel, Alexander Alder
Medill, R. L. Kalispell
McTucker, Nat Dixon
Mortinell, Ray Dell
Murdock, Wallace Sun River
McSweyn, Allen Birney
Nelson, Charles Lewistown
Nickelson, Frank Livingston
Nicolai, Richard S. Great Falls
Prescott, Allen Helena
Pickle, Fred L. Powell, Wyo.
Redfield, James Bozeman
Russell, Charles E. Luther
Schoner, Charles Whitehall
Shreve, Bennie Decker
Spaulding, Charles L. Bozeman
Studebaker, Floyd Broadview
Steves, Walter Livingston
Tinder, Rodney Norris
Taylor, Leland B. Hamilton
Tinder, Will Norris
Thompson, Will Decker
Thorp, Charles W. Galway, Ire.
Tronson, Harry Great Falls
Williams, Earl Jackson, Mo.
Wood, Gordon Troy
Walker, Ira Rock Creek
Weldon, Herbert Butte
Wheeler, Hobart H. Froid
Young, Robert Victor

SUMMER SESSION—1914.

Arnold, Alice Belgrade
Bader, Gertrude P. Stevensville
Benham, Bessy Salesville
Billington, S. J. White Sulphur Springs
Billington, Jessie White Sulphur Springs
Borthwick, Alberta Hamar, N. D.
Brainard, Bess Wilsall
Breneman, Annie Choteau
Byers, Mrs. Anna M. Manhattan
Barton, E. C. Livingston
Breeze, Moses Cambridge, Wis.
Bennett, G. G. Bozeman
Clothier, Francis A. Judith Gap
Cheeseman, J. F. Manhattan
Cass, F. M. Bozeman
Chapman, A. L. Bozeman
Clark, L. G. Helena
Cross, E. W. Livingston
Colson, R. B. Wilsall

Dawes, Rhoda Bozeman
Durfee, Adelaide Philipsburg
Dulin, T. S. Hamilton
Divine, S. L. Bozeman
Duven, William Manhattan
Daugherty, R. H. Butte
Elam, Ethel Salesville
Erickson, E. A. Big Timber
Edgington, Robert C. Helena
Forrest, Daisie E. Terry
Grandjean, Antonia Libby
Greene, Alberta Lewistown
Gibbs, G. H. Bozeman
Harkins, Ina Mary Topeka, Kan.
Harmon, Ella Bozeman
Hedrick, Charlotte Bozeman
Hess, F. O. Havre
Hunter, J. L. Bozeman
Icenogle, Mrs. Mary R. Bozeman
Jones, Ray S. Bozeman
Junk, Laura E. Great Falls
Jordan, Walter M. Butte
Ketridge, Anna M. Libby
Korab, Frank H. Spring Lake
Linfield, Leila Bozeman
Lynn, F. E. Nelagony, Okla.
Lacklin, Jesse Dillon
Martin, G. L. Bozeman
Martin, Mrs. G. L. Bozeman
Martinsdale, Irma Red Lodge
McJunkin, J. H. Missoula
Massman, May Melrose, Iowa
Maynard, Edith L. Polson
Moore, Inez Valley City, N. D.
McClelland, D. T. Corvallis
Nebel, Anna Bozeman
Nelson, Ingeborg Froid
Nickeson, Glee Baker
Perring, Alice Irene Salesville
Post, Clara M. Belgrade
Powell, G. L. Billings
Parker, J. E. Helena
Pope, Joseph Laurel
Randall, Cordelia Toston
Riley, Mrs. E. H. Bozeman
Russell, Eva Three Forks
Ratch, P. E. Belgrade
Reed, Walter B. Billings
Ross, J. M. Anaconda
Sabin, Mrs. Ora K. Hedgesville
Sabin, George Hedgesville
Sales, Lynde Bozeman

Schwenneker, Alice	Fishtail
Seeley, Florence	Bozeman
Slater, Alta	Three Forks
Stillman, Madge J.	Milwaukee, Wis.
Swenson, Hilve M.	Armington
Sloan, W. N.	Helena
Stephenson, Thos.	Helena
Talbott, Mary A.	Centerville, Iowa
Thompson, Homer	Three Forks
Tripp, Hallie M.	Flatwillow
Trip, Harry W.	Flatwillow
Titus, D. B.	Kalispell
Tenney, C. W.	Helena
Vaughan, C. L.	Bozeman
Valiant, Edgar A.	Bozeman
Wolfe, Geo. D.	Butte
Wilson, Elva	Bozeman
Wylie, Eleanor B.	Bozeman
Welburn, Miss	Three Forks

MUSIC STUDENTS

Abell, Tracy	Voice	Bozeman
Ailinger, Lola	Piano	Denver, Colo.
Alexander, Maud	Piano-Counterpoint	Bozeman
Allen, Mollie	Piano	Butte
Anderson, Hazel	Voice	Lewistown
Axtell, Lillian	Voice	Belgrade
Bancroft, Helen	Voice	Manhattan
Barker, Pearl	Piano	Bozeman
Beatty, Lura	Voice	Bozeman
Beck, Elsie	Piano	Bozeman
Benham, Bessie	Piano	Salesville
Blair, Dorothy	Violin	Bozeman
Bole, Elizabeth	Piano	Bozeman
Border, Lela	Piano	Bozeman
Borthwick, Alberta	Voice	Hamar, N. D.
Bressler, Ruby	Piano	Bozeman
Brandenburg, Jonas	Violin	Bozeman
Brown, Mrs. Fred	Piano	Bozeman
Burgraff, Mary	Piano	Stearns
Cannon, Raymond	Voice	Bozeman
Cannon, Vera	Voice	Bozeman
Carpenter, Ethel	Piano	Great Falls
Clarkson, Robert	Violin	Chinook
Cobleigh, Winnifred	Piano	Bozeman
Cochran, Hazel	Piano	Bozeman
Coffey, Hazel	Violin	Bozeman
Cooley, Esther Belle	Piano	Bozeman
Cooley, George	Voice	Bozeman
Darrow, Vivian	Piano	Laurel

Davidson, Paul	Violin	Bozeman
Eberle, Alfred	Violin	Butte
Elliot, Mae	Piano	Roundup
Esgar, Ray	Piano	Bozeman
Finlay, William	Voice	Bozeman
Fletcher, Elizabeth	Voice	Bozeman
Fransham, Edna	Piano	Bozeman
Gray, Florence	Piano	Bozeman
Griffin, Amelia	Piano	Bozeman
Griffin, Juanita	Piano	Bozeman
Haller, Buelah	Piano	Butte
Hanks, Clementine	Violin	Butte
Hartman, Leah	Piano-Counterpoint	Bozeman
Henke, Bud	Violin	Bozeman
Hodgskiss, Ruby	Piano	Choteau
Hollier, Georgia	Piano	Bozeman
Hollier, Myrtle	Piano	Bozeman
Hollier, Trena	Piano	Bozeman
Howard, Josephine	Violin	Bozeman
Hoyem, George	Violin	Three Forks
Hutchinson, Helen	Piano	Bozeman
Jacobs, Edward	Violin	Delta, Colo.
Jacobs, Erlene	Piano	Bozeman
Johannes, Mrs. R.	Piano	Bozeman
Johnson, Jessie	Piano	Belt
Jones, Ray	Violin	Livingston
Kammerer, Sophie	Piano, History, Counterpoint,	Bozeman
Kelley, Jeanette	Piano	Deer Lodge
Kelly, Edwin	Piano	Bozeman
Kennard, Eveleen	Piano	Kinsey
Kimm, Trinia	Piano	Belgrade
Kinsella, Olive	Voice	Bozeman
Kirschner, Hortense	Piano-Voice	Bozeman
Kountze, Emmet	Violin	Bozeman
La Bonte, Walter	Violin	Bozeman
Lay, Fred	Violin	Bozeman
Leach, Wilhelmina	Piano	Bozeman
Lehfeldt, Martha	Piano	Broadview
Lessel, Erma	Piano	Butte
LeVeque, Evelyn	Piano	Bozeman
Linfield, Azalea	Piano	Bozeman
Linfield, Leila	Piano	Bozeman
Mapes, Mrs.	Piano	Bozeman
McCay, Elmyra	Piano	Bozeman
McCone, Alice	Piano	Glendive
McDonnell, Annie	Piano	Bozeman
Miewald, Ethel	Piano	Chinook
Mills, Gwendolyn	Piano	Helena
Monforton, Lucile	Piano	Bozeman
Monroe, Mrs. M. G.	Piano	Bozeman
Muse, George	Violin	Bozeman
Myers, Mae	Piano	Billings

Niebel, Esther	Piano	Bozeman
Nielson, Elmer	Piano	Salesville
O'Donnell, Kathleen	Violin	Bozeman
Orvis, Worth	Piano, Hist., Counterpoint	Salesville
Pease, Muriel	Piano	Bozeman
Piedalue, Aimee	Voice	Bozeman
Pippinger, Harold	Violin	Bozeman
Pippy, Elizabeth	Piano	Shelby
Pool, Florence	Piano	Townsend
Post, Clara	Piano	Belgrade
Richter, Marian	Piano	Bozeman
Riddell, Marsa	Voice	Helena
Robb, Frieda	Piano	Dillon
Rose, Helen	Voice	Bozeman
Roubidoux, Llewelyn	Violin	Ft. Hall, Idaho
Rush, Winnie	Piano	Bozeman
Sales, Zada	Piano-Voice	Bozeman
Shannon, Evelyn	Piano	Lewistown
Smith, Belle	Piano	Manhattan
Stanly, Amelia	Piano	Great Falls
Steel, Hamilton	Voice	Great Falls
Story, Nelson	Violin	Bozeman
Taylor, Emma	Piano	Bozeman
Truitt, Alonzo	Voice	Bozeman
Walker, Cecil	Voice	Bozeman
Wight, Florence	Piano	White Sulphur Springs
Wilcomb, Grace	Piano-Voice	Laurin
Wilson, Kathleen	Piano	Bozeman
Wohlfrom, Augustus	Violin	Bozeman
Wood, Helen	Piano	Glendive
Young, Ethel	Piano	Bozeman

FARMERS' AND HOMEMAKERS' SHORT COURSES

Anderson, Charles B.	Bozeman
Alderson, Frank	Bozeman
Anderson, Anna	Bozeman
Anderson, Mrs. W. H.	Bozeman
Allseh, Ezra	Bozeman
Alderson, Charles R.	Anceney
Axtell, C. E.	Salesville
Accola, Louis	Bozeman
Briggs, Arthur S.	Bozeman
Bradshaw, W. J.	Knowlton
Bergen, Mrs. J. C.	Bozeman
Bunnell, John L.	Bozeman
Bergen, J. C.	Bozeman
Burns, John T.	Billings
Black, Albert	Helena
Badgley, S. B.	Salesville

Baker, Lea Bozeman
Brownell, Mrs. M. C. Bozeman
Brown, J. N. Bozeman
Bassett, C. E. Washington, D. C.
Baab, Henry Willow Creek
Burke, W. E. Bozeman
Brownell, W. I. Belgrade
Bishop, Mrs. Marie G. Bozeman
Berier, Agnes R. Logan
Brownell, Mrs. W. I. Belgrade
Baker, Leila M. Lewistown
Buell, Mrs. H. S. Bozeman
Bailey, Mrs. C. F. Bozeman
Breneman, D. I. Bozeman
Breitenstein, A. J. Helena
Burke, Mrs. Walter E. Bozeman
Burns, John H. Wolf Creek
Bohart, W. O. Bozeman
Beall, B. G. Roberts
Clark, J. M. Bozeman
Cooper, Theodore Willow Creek
Casenhaver, Wm. Helena
Cash, Lawrence Benchland
Conrow, Samuel H. Belgrade
Cooley, Mrs. R. A. Bozeman
Callaghan, Mrs. Charles Bozeman
Conkling, Mrs. Leon D. Bozeman
Chase, F. Josiah Miles City
Cramer, Arthur E. Belgrade
Clark, W. S. Hendersonville, N. C.
Carter, Eugene W. Livingston
Clark, Florence L. McGregor, Iowa
Chaney, John W. Bozeman
Collett, John F. Bozeman
Carpenter, Alvin Clyde Park
Chapman, Mrs. A. L. Bozeman
Cramer, Mrs. A. E. Belgrade
Cehrs, Adda V. Bozeman
Colton, O. C. Bozeman
Chess, A. B. Bozeman
Caldwell, Leigh W. Valier
Cole, W. B. Helena
Commings, Mrs. C. H. Livingston
Clarkson, Robert W. Chinook
Commings, Charles H. Livingston
Clark, Olive L. Bozeman
Clark, Mrs. Robert W. Salesville
Casey, Robert Hobson
Davis, E. Willow Creek
Duncan, B. S. Belgrade
Duncan, Mrs. B. S. Belgrade
Davis, Mrs. L. M. Salesville

Davis, W. H. Salesville
Donaldson, Jessie Bozeman
De Boer, Mrs. Three Forks
Davis, Mrs. George E. Bozeman
Deboes, Jacob Three Forks
Davidson, Mrs. W. S. Bozeman
Donaldson, N. C. Moccasin
Dorr, Joseph Hamilton
Eyre, Mrs. T. W. Augusta
Emory, James R. Red Lodge
Eckstein, Mary E. Kalispell
Emory, Mrs. J. R. Red Lodge
Elliot, Erwin G. Bozeman
Elder, A. Miles City
Ensinger, Wiliam Bozeman
Erwin, Mrs. W. S. Bozeman
Elliott, O. H. Bozeman
Eberhart, John Bozeman
Flannery, Ida B. Belgrade
Frederick, Mrs. T. J. Gilman
Fowler, Rose Bozeman
Ferguson, Minnie Roundup
Fritz, Emma L. Miles City
Fraser, E. W. Billings
Ferguson, Floyd Bozeman
Flannery, Wm. F. Belgrade
Fransham, W. J. Livingston
Floweree, Daniel A. G. Helena
Flinn, Amelia Thompson
Gibson, George Smoky Butte
Gray, F. S. Great Falls
Grunwald, Kurt Great Falls
Gray, Mrs. Charles W. Chouteau
Ginn, C. N. Clyde Park
Gatiss, Robert H. Creston
Gilchrist, Edgar Belgrade
Griffin, H. Great Falls
Huffine, John C. Bozeman
Hayden, J. R. Salesville
Ham, Mrs. F. W. Bozeman
Hoadley, Ernest Bozeman
Hoyt, Bell Sidney
Hamlett, Mrs. D. A. Salesville
Hast, Richard A. Billings
Haley, J. S. Bozeman
Hamlett, D. A. Salesville
Harmon, W. E. Bozeman
Hough, Mrs. B. G. Smoky Butte
Hess, Ella E. Libby
Haynes, Mabel Boulder
Hays, Mrs. Will Bozeman
Hart, Mrs. A. S. Bozeman

Hough, Mrs. W. A. Belgrade
Hansen, Charles L. Missoula
Hillman, Frank M. Kalispell
House, Mrs. Wiliam H. Clyde Park
Henry, Lee W. Cascade
Hoadley, Mrs. E. D. Bozeman
Hanson, Carl J. Miles City
House, William H. Clyde Park
Hogan, G. W. Bozeman
Haynes, John M. Clancy
Hull, Mrs. George Bozeman
Houston, Mrs. E. L. Bozeman
Heare, E. A. Red Lodge
Hough, B. G. Smoky Butte
House, W. H. Bozeman
Ingram, C. C. Helena
Irwin, Bethel Hamilton
Irwin, William L. Gregson
Johnson, Mrs. H. F. Bozeman
Johnson, H. F. Bozeman
Jeffers, Mrs. J. B. Jeffers
Jones, J. J. Cascade
Johnson, O. J. Miles City
Jensen, Charles Livingston
Johnson, W. L. Bozeman
Jones, Mrs. J. H. Cascade
Jeffers, J. B. Jeffers
Jenkins, Ira J. Bozeman
Knowles, Ferdinand F. Hunter's Hot Springs
Kirschner, J. W. Bozeman
Kremer, John H. Belgrade
Knowles, A. D. Butte
Kremer, W. J. Ennis
Klener, Mrs. Lena Bozeman
Knadler, A. P. Bozeman
Kirk, Helen A. Bozeman
Kim, Harris Bozeman
King, Robert F. Willow Creek
Kirk, Thomas S. Bozeman
Kolb, Percy F. Billings
Lee, B. Willow Creek
Leach, Wilhelminia Bozeman
Lund, V. Jr. Bozeman
Lewis, G. M. Manhattan
Leach, Mrs. William Bozeman
Lawrence, S. F. Hardin
Lamerell, E. H. Bozeman
Lyon, Mary E. Forest Grove
Longbridge, F. Bozeman
Lorentz, W. B. Toston
Law, James A. Fishtail
Lee, Virtell Mrs. Prosser, Wash.

Lillard, J. W. Bozeman
Langohr, Don Bozeman
Lillard, Mrs. A. J. Bozeman
Lyon, F. O. Forest Grove
Leonard, Annette Baker
Leggett, Walter Manhattan
Linfield, Mary A. Bozeman
Lareau, Harmidas Helena
McLean, H. H. Finn
McKenzie, R. W. Three Forks
Morgan, Albert B. Maudlow
Mehlberg, Frank H. Reed Point
Marble, Mrs. C. F. Bozeman
Miller, Mrs. Mary I. Bozeman
Meeds, Clifford A. Twin Bridges
Murray, Emmett Butte
Murray, Mrs. J. T. Three Forks
Muir, William G. Logan
MacLeod, Mrs. David Bozeman
Morgan, Mrs. L. J. Bozeman
Moore, Sanford Bozeman
Metzel, W. Alder
Metzel, Mrs. W. O. Alder
Marble, Charles Bozeman
Martin, Mrs. Jean D. Bozeman
Marble, James T. Bozeman
Matthew, Clarence Bozeman
Moges, Mrs. Eva K. Bozeman
Mark, Walter H. Willow Creek
Matthew, Herman R. Bozeman
Moore, Mrs. E. J. Bozeman
Nash, E. D. Helena
Niebel, Matt Bozeman
Norris, Benton Bozeman
Nash, Mrs. W. J. Bozeman
Nash, W. J. Bozeman
Nordquist, C. Bozeman
Nelson, N. C. Lewistown
Norris, Mrs. Minnie Bozeman
Newberry, Otto Ekalaka
Olsen, John L. Bozeman
Olsen, Mrs. John L. Bozeman
Oerding, O. Great Falls
Peets, John M. Bozeman
Page, Guy W. Wibaux
Pinckney, Mrs. R. M. Bozeman
Parkin, Mrs. E. J. Bozeman
Patton, Mrs. Art Manhattan
Peets, Mrs. J. M. Bozeman
Parker, Charles M. Bozeman
Patton, Arthur Manhattan
Potter, W. J. Bozeman

Ross, Alexander Ada
Rutledge, Mrs. A. T. Bozeman
Riley, Mrs. E. H. Bozeman
Reichman, Lester C. Belgrade
Rossman, Mrs. J. J. Bozeman
Rich, Mrs. E. T. Bozeman
Rofland, Nellie B. Lewistown
Revell, Frank E. Sappington
Ravet, Henry Bozeman
Rhein, Albert Wolf Creek
Rossman, J. J. Bozeman
Spick, Charles Bozeman
Summers, Harry L. Bozeman
Stiff, Gertrude Bozeman
Smith, Harry L. Bozeman
Spick, Lulu Bozeman
Stary, Ned Shirley
Shea, Julia Butte
Smith, Kirk Livingston
Shaw, A. L. Ekalaka
Smith, M. O. Bozeman
Stone, D. P. Belgrade
Steeve, Marvin D. Livingston
Schumaker, Mrs. M. Bozeman
Selway, Mrs. Mark M. Bozeman
Stevenson, T. F. Bozeman
Stuart, T. L. Bozeman
Schoppe, Mrs. W. L. Bozeman
Schrammech, Clifford Cascade
Shull, Mary Missoula
Swing, J. L. Sheridan
Shea, Julia Butte
Seidlitz, Mrs. R. P. Bozeman
Stephens, Elvin G. Twin Bridges
Smith, Ralph C. Dillon
Smith, Emily J. C. Logan
Shaw, Thomas St. Paul, Minn.
Stuchen, Mrs. P. J. Logan
Scanlan, Edward Manhattan
Solberg, Inga Big Timber
Smith, R. de B. Helena
Settle, Mrs. M. J. Bozeman
Townsend, Wm. Bozeman
Tharber, W. S. Lewiston, Idaho
Tenney, Charles W. Helena
Taylor, J. C., ... Wibaux
Tintinger, George W. Cascade
Tintinger, Lester E. Cascade
Tretsven, Mrs. Oscar Bozeman
Tice, Maud Logan
Taber, Mrs. Charles S. Bozeman
Townsend, William, ... Bozeman

Van Camp, Forest E. Martinsdale
Vandenhook, Charles Bozeman
Vaux, Augustus Sidney
Wipf, J. C. Belgrade
Whitney, Albert R. Belgrade
Wood, C. N. Bozeman
Weir, John A. Logan
Wiliams, Phibe, Comfort Virginia City
Wiliams, Olive Idaho Falls, Idaho
Welch, Mrs. Howard Bozeman
Wilcomb, Mrs. F. H. Laurin
Whipple, Mrs. O. B. Bozeman
Wills, Elizabeth Red Lodge
Ward, Oliver B. Salesville
Walrath, A. J. Bozeman
White, Mrs. Stephen Bozeman
Wilson, Mrs. M. R. Bozeman
Whitcomb, Abigail Hess Bozeman
Wylie, John W. Bozeman
Willson, George H. Bozeman
Wilson, E. A. Mandan, N. D.
Werre, H. M. Bozeman
Watson, Mrs. L. W. Bozeman
Wills, Nat Red Lodge
Walker W. E. Bozeman
Wilson, F. C. Pray
Walton, Alfred O. Belgrade
Yergey, Alford Bozeman

SUMMARY OF STUDENTS.
1914-15

Graduates	7	
Seniors	38	
Juniors	33	
Sophomores	67	
Freshmen	114	
Irregulars	23	
School of Home Economics	29	
School of Mechanic Arts	36	
School of Agriculture	97	
Total		444
Music (not taking other studies)		51
Farmers' and Homemakers' Short Courses		305
Summer School (not counted elsewhere)		86
Grand Total		886

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UNIVERSITY OF MONTANA BULLETIN

STATE COLLEGE SERIES NEW NO. 1

STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS

Twenty-Second Annual Catalogue

1915 - 1916

BOZEMAN, MONTANA
MAY 1916

Entered September 7, 1906, at Bozeman Montana, as Second Class Matter Under Act of Congress July 16, 1894.

The University of Montana

The University of Montana is constituted under the provisions of Chapter 92 of the Laws of the Thirteenth Legislative Assembly, March 14, 1913 (effective July 1, 1913).

The general control and supervision of the University is vested in the State Board of Education. The Chancellor of the University is the chief executive officer. For each of the component institutions there is a local executive board.

Montana State Board of Education

S. V. STEWART, Governor			Ex-officio, President
J. B. POINDEXTER, Attorney General			Ex-officio
H. A. DAVEE, Supt. of Pub. Instruction			Ex-officio, Secretary
S. D. LARGENT	(1916)	J. BRUCE KREMER	(1918)
W. S. HARTMAN	(1916)	C. H. HALL	(1918)
JOHN DIETRICH	(1917)	LEO FAUST	(1919)
A. L. STONE	(1917)	W. H. NYE	(1919)

EDWARD C. ELLIOTT, Chancellor of the University

The University comprises the following institutions, schools and departments:

THE STATE UNIVERSITY at Missoula.
Established February 17, 1893, and consisting of:

The College of Arts and Sciences,
The School of Law,
The School of Pharmacy,
The School of Forestry,
The School of Journalism,
The School of Music,
The Summer Session,
The Biological Station, (Flathead Lake)
The Extension Service,
The Graduate Department.

FREDERICK C. SCHEUCH, Acting President.

THE STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS at Bozeman.
Established February 16, 1893, and consisting of:

The College of Agriculture,
The College of Engineering,
The College of Applied Science
The College of Industrial Arts,
The School of Music,
The Summer Session,
The Secondary Schools,
Home Economics,
Mechanic Arts,
Agriculture,
The Agricultural Experiment Station,
The Agricultural Extension Service.

JAMES M. HAMILTON, President.

THE STATE SCHOOL OF MINES at Butte.
Established February 17, 1893.
CHARLES H. BOWMAN, President.

THE STATE NORMAL COLLEGE at Dillon.
Established February 23, 1893, and consisting of:

The Two-year Elementary Course,
The Three-year Course,
The Four-year Course,
The Graduate Course.

JOSEPH E. MONROE, President.

For publications and detailed information concerning the different schoo and colleges, address the President of the particular institution concerne Communications intended for the Chancellor of the University should addressed to the State Capitol, Helena, Montana.

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1917 CALENDAR 1917

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DECEMBER						
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Calendar

1916

June 12, Monday Six Weeks Summer Session begins
Sept. 12-13, Tues.-Wed.....Registration and Examination for Entrance and Conditions.
Sept. 14, Thursday.....Instruction begins 8:00 a. m.
Oct. 2-3, Mon. Tues.....Six Months Courses examinations, to Remove Conditions
Oct. 3, Tuesday.....Registration for Six Months Courses
Oct. 4, Wednesday.....Instruction Six Months Courses Begins
Oct. 12, Thursday.....Columbus Day, a Holiday
Oct. 27, Friday Standing of College Students Reported
Nov. 10, Friday.....Standing of Students in Six Months Courses Reported.
Nov. 23-24-25, Thurs.-Fri.-Sat.....Thanksgiving Recess
Dec. 14-15, Thurs.-Fri. Examinations for Students in Six Months Courses.
Dec. 16, Saturday noon.....Standing of College Students Reported
Dec. 21, Thursday.....Christmas Vacation begins

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Jan. 4, Thursday, 8 a. m.....Vacation Ends and College Courses Begin.
Jan. 4, Thursday Registration Second Semester Six Months Courses.
Jan. 5, Friday.....Second Semester Six Months Courses begins
Jan. 29, Monday.....Semester Examinations Begin
Jan. 29 to Feb.3, Mon. to Sat.....Farmers' Week
Feb. 2, Friday.....First Semester College Ends
Feb. 2-3, Fri.-Sat.....Examinations for Conditions
Feb. 6-7, Tues.- Wed.....Registration Second Semester College
Feb. 8, Thursday.....Instruction Begins
Feb. 12, Monday.....Lincoln's Birthday, a Holiday
Feb. 16, Friday Standing of Students Six Months Courses Reported.
Feb. 22, Thursday.....Washington's Birthday, a Holiday
Mar. 8-9-10, Thurs.-Fri.-Sat.....Interscholastic Basketball Tournament
Mar. 16, Friday.....Standing College Students Reported
Mar. 22, Thursday.....Commencement, Six Months Courses
Mar. 23, Friday Six Months Courses Close
April 27, Friday.....Standing College Students Reported
May 28, Monday Semester Examinations Begin
May 30, Wednesday..... Memorial Day, a Holiday
June 1-2, Fri. Sat.....Examinations for Conditions
June 3 to 7, Sun. to Thurs. Commencement Week.

Administrative Officers

EDWARD C. ELLIOTT, Ph. D.....Chancellor, University of Montana
JAMES M. HAMILTON, M. S.....President
FREDERICK B. LINFIELD, B. S. A.....Dean of Agriculture
ARTHUR W. RICHTER, M. M. E.....Dean of Engineering
FRED S. COOLEY, B. S.....Director of Extension Work
UNA B. HERRICK Dean of Women
JOHN H. HOLST Principal Secondary Schools
GEORGE R. CALLAWAY.....Secretary and Treasurer
R. ORVIS WILSON, B. S.....Registrar
ELIZABETH FORREST, B. L. S.....Librarian
JOHN C. PARK Superintendent of Buildings

Professors and Assistant Professors

ARNETT, CLARE NEWTON, B. S. A., Professor of Animal Husbandry.
B. S. A., Purdue University, 1907.

ATKINSON, ALFRED, M. S.....Professor of Agronomy
B. S., Iowa State College, 1904; M. S., Cornell University, 1912.

BALDWIN, LANA A.....Assistant Professor of Art
Woman's Art School.

BALLINGER, FLORENCE Assistant Professor of Domestic Art
McDowell School of Dressmaking.

BENNION, FRED, A. B.....Director of Athletics
and Instructor in Physical Education
A. B., University of Utah, 1907.

BOGUE, ROBERT H., M. S.....Assistant Professor of Chemistry
B. S., Tufts College, 1912; M. S., Massachusetts Agricultural College, 1915.

BREWER, WILLIAM F., A. M.....Professor of English
A. B., Grinnell College, 1891; A. M., Grinnell College, 1897; A. M., Harvard University, 1899.

BREWER, HELEN R., A. B.....Assistant Professor of History
A. B. Grinnell College, 1888.

CEHRS, CARRIE, M., A. M.....Assistant Professor of German
A. B., University of Denver, 1904; A. M., University of Denver, 1907.

CHALLENDER, RALPH T., B. S.....Assistant Professor of
Mechanical Engineering.
B. S., Kansas State Agricultural College, 1908.

COBLEIGH, WILLIAM M., A. M. Professor of Chemistry
E. M., College of Montana, 1894; A. M., Columbia University, 1899.

CONKLING, LEON D., C. E.....Professor of Civil Engineering
C. E., Cornell University, 1900.

COOLEY, ROBERT A., B. S.....Professor of Zoology and Entomology
B. S., Massachusetts Agricultural College, 1895.

CURRIER, EDWIN L., B. S., Assistant Professor of Farm Management.
B. S., University of Nebraska, 1912.

CURRIER, Aaron H., A. M.....Director of the School of Music and Professor of Vocal Music.
A. B., Oberlin College, 1892; A. M., Oberlin College, 1894.

DEARBORN, CHARLES S., B. S., Professor of Mechanical Engineering.
B. S., Kansas State Agricultural College, 1904.

DUDDY, EDWARD A., A. M.,.....Assistant Professor of English
A. B., Bowdoin College, 1907; A. M., Harvard University, 1908.

FOOTE, HERBERT B., M. A.....Assistant Professor of Botany and Bacteriology.
B. S., Ottawa University, 1913; M. A., Kansas University, 1914.

FORD, CARLOTTA MARKS, A. B.....Assistant Professor of Home Economics.
A. B., University of Illinois, 1911.

HAMILTON, JAMES M., M. S.....President and Professor of Psychology and Economics.
B. S., Union Christian College, 1887; M. S., Union Christion College, 1890.

HAM, FRANK W., M. S.....Professor of Physics
B. S., Montana State College, 1903; M. S., Montana State College, 1905.

HARKINS, LILLA, A., M. S.....Professor of Home Economics
B. S., South Dakota State College, 1890; M. S., South Dakota State College, 1898.

HERRICK, UNA B. Dean of Women and Instructor in Physical Education for Women.

HOLST, JOHN H.....Principal Secondary School and Summer Session and Instructor in English.

*JENNISON, HARRY M., M. A.....Assistant Professor of Botany and Bacteriology.
B. S., Massachussetts Agricultural College, 1908; M. A. Wabash College, 1910.

LINFIELD, FREDERICK B., B. S. A.,.....Dean of Agriculture
B. S. A., Ontario Agricultural College, 1891.

MARTIN, GEORGE LESTER, B. S., Professor of Dairy Husbandry.
B. S., Iowa State College, 1908.

MURDOCK, HARVEY E., M. E., C. E.....Assistant Professor of Farm Mechanics.
B. S., University of Colorado, 1906; M. E., University of Illinois, 1908; C. E. University of Illinois, 1911.

*On leave of absence.

NASH, W. GIFFORD.....Professor of Piano Music
Student in Leipzig and London.

PLEW, WILLIAM R., M. S.....Professor of Architectural Engineering
B. S., Rose Polytechnic Institute, 1907; M. S., Rose Polytechnic Institute, 1910.

RICHTER, ARTHUR W., M. M. E.....Dean of Engineering
B. M. E., University of Wisconsin, 1889; M. E., University of Wisconsin, 1891; M. M. E., Cornell University, 1899.

RILEY, EDWARD H., D. V. M.....Assistant Professor of Animal Husbandry.
B. S. A., University of Minnesota, 1903; D. V. M., George Washington University, 1911.

SCHOPPE, WILLIAM F., M. S.....Professor of Poultry Husbandry
B. S., University of Maine, 1907; M. S., University of Maine, 1913.

SNOW, FRANK C., C. E.....Assistant Professor of Civil Engineering
C. E., Ohio State University, 1906.

SPAULDING, MILO HERRICK, A. M.....Assistant Professor of Zoology
A. B., Leland Stanford Junior University, 1903; A. M., Leland Stanford Junior University, 1906.

STARRING, CECIL C. B. S.....Assistant Professor of Horticulture
B. S., South Dakota State College, 1911.

SWINGLE, DEANE B., M. S.....Professor of Botany and Bacteriology
B. S., Kansas State Agricultural College, 1900; M. S., University of Wisconsin, 1901.

TALLMAN, WILLIAM D., B. S.....Professor of Mathematics
B. S., University of Wisconsin, 1896.

THALER, JOSEPH A., E. E.....Professor of Electrical Engineering
E. E., University of Minnesota, 1900.

WELCH, HOWARD, D. V. M.....Professor of Veterinary Science
A. B., University of Missouri, 1902; B. S. A., University of Missouri, 1906; D. V. M., Cornell University, 1909.

WHIPPLE, ORVILLE B., B. S.....Professor of Horticulture
B. S., Kansas State Agricultural College, 1904.

WHITCOMB, WILLIAM O., M. S. A., Assistant Professor of Agronomy
B. S. A., North Dakota Agricultural College, 1909; M. S. A., Cornell University, 1913.

Instructors and Assistants

BULL, FRIEDA M., M. S.....Instructor in Mathematics
B. S., Montana State College, 1907; M. S., Montana State College, 1909.

BURKET, ALONZO B., B. S.....Assistant in Chemistry
B. S., Montana State College, 1915.

GEPHART, GEORGE C., A. B.....Instructor in Secretarial Studies
A. B., Ohio State University, 1915.

GOTTSCHALK, CARL, M. S.....Assistant in Chemistry and Assistant Analyst in State Food and Water Laboratory.
B. S., Montana State College, 1909; M. S., Montana State College, 1910.

HAINES, WILL T., B. S.....Instructor in Electrical Engineering
B. S., Montana State College, 1911.

HARTMAN, JUNE, B. S.....Instructor in Piano
B. S., Montana State College, 1910.

HOMANN, FRED C.....Assistant in Shops

HOWARD, LOUIS L.....Instructor in Band Music

HYTREE, EDWARD C., A. M.....Instructor in Chemistry
B. S., Ohio Wesleyan University, 1912; A. M., Ohio State University, 1914.

JACKSON, FRED O.....Instructor in Violin and Orchestra

JONES, THEDA M.....Instructor in Stenography and Typewriting

KATELY, FRED Instructor in Forge and Foundry

KIEFER, JAMES A., B. S.....Instructor in Physics
B. S., Montana State College, 1914.

McKINNEY, EVA.....Assistant in Physical Education for Women

MILLER, F. CLIFFORD, B. S.....Instructor in Mechanical Engineering
B. S., James Millikin University, 1912.

MOORE, MURIEL.....Instructor in Art
Woman's Art School, 1908.

PARKS, JOHN C.....Assistant in Engineering

RICHARDSON, REEVE.....Assistant in Physical Education for Men

ROMNEY, G. OTTO, A. B.....Assistant in English
A. B., University of Utah, 1913.

SCHWALBE, GERTRUDE, A. B.....Instructor in English
A. B., University of Wisconsin, 1909.

SHEA, HENRY M., M. S.....Food and Drug Analyst
Ph. G., South Dakota State College, 1911; B. S., South Dakota State College, 1913; M. S., South Dakota State College, 1915.

SMITH, M. ALDA, B. S.....Instructor in Home Economics
B. S., Montana State College, 1913.

TRETSVEN, OSCAR Assistant in Animal Husbandry

WALLIN, FLORENCE, A. B.....Instructor in French and Spanish
A. B., State University of Iowa, 1907.

Experiment Station Staff

LINFIELD, FREDERICK B., B. S. A.....Director
B. S. A., Ontario Agricultural College, 1891.

ARNETT, CLARE NEWTON, B. S. A.....Animal Husbandman
B. S. A., Purdue University, 1907.

ATKINSON, ALFRED, M. S.....Agronomist
B. S., Iowa State College, 1904; M. S., Cornell University, 1912.

BURKE, EDMUND, B. S.....Chemist and Meteorologist
B. S., Montana State College, 1907.

COOLEY, ROBERT A., B. S.....Entomologist
B. S., Massachusetts Agricultural College, 1895.

CURRIER, EDWIN L., B. S.....Farm Management
B. S., University of Nebraska, 1912.

DODDERIDGE, RUSSELL R., B. S.....Assistant Animal Husbandman
B. S., Kansas State Agricultural College, 1912.

GIESEKER, LEONARD F., M. S.....Assistant Agronomist
B. S., University of Nebraska, 1908; M. S. A., Cornell University, 1914.

JAHNKE, EMIL W., B. S.....Assistant Superintendent Grain Laboratory
B. S., University of Minnesota, 1915.

JONES, RAY S., B. S.....Assistant Chemist
B. S., Montana State College, 1915.

MORRIS, H. E., B. S.....Assistant Botanist and Bacteriologist
B. S., Montana State College, 1909

MURDOCK, HARVEY E., M. E., C. E.....Agricultural Engineer
B. S., University of Colorado, 1906; M. E., University of Illinois, 1908; C. E., University of Illinois, 1911.

NELSON, JOSEPH B.....Assistant Agronomist

PARKER, JOHN R., B. S.....Assistant Entomologist
B. S., Massachusetts Agricultural College, 1908.

PINCKNEY, REUBEN M., M. A.....Assistant Chemist
B. S., Nebraska Wesleyan University, 1906; A. M., University of Nebraska, 1908.

QUINN, E. J., B. S. Assistant Chemist
B. S., Notre Dame University, 1911.

SCHOPPE, WILLIAM F., M. S.....Poultryman
B. S., University of Maine, 1907; M. S., University of Maine, 1913.

SMITH, GEORGE E., B. S. A.....Assistant Chemist
B. S. A., University of Toronto, 1910.

STARRING, CECIL C., B. S.....Assistant Horticulturist
B. S., South Dakota State College, 1911.

SWINGLE, DEANE B., M. S.....Botanist and Bacteriologist
B. S., Kansas State Agricultural College, 1900; M. S., University of Wisconsin, 1901.

TRETSVEN, OSCAR Assistant Animal Husbandman

WELCH, HOWARD, D. V. M.....Veterinarian
A. B., University of Missouri, 1902; B. S. A., University of Missouri, 1906; D. V. M., Cornell University, 1909.

WHIPPLE, ORVILLE B., B. S.....Horticulturist
B. S., Kansas State Agricultural College, 1904.

WHITLOCK, BERT W., B. S.....Superintendent of Grain Laboratory
B. S., Kansas State Agricultural College, 1913.

WOOD, D. C., B. S.....Assistant Farm Management
B. S., University of Missouri, 1915.

Agricultural Extension Staff

COOLEY, FRED S., B. S.....Director
B. S., Massachusetts Agricultural College, 1888.

BANKER, PAUL P., B. S., County Agriculturist, Hill County, Havre.
B. S., University of Wisconsin, 1911.

BLANCHARD, RALPH A., B. S., County Agriculturist, Cascade County, Great Falls.
B. S., Oregon Agricultural College, 1912.

CAMPBELL, J. R., M. S., County Agriculturist, Missoula County, Missoula.
B. S., Iowa State College, 1909; M. S., Iowa State College, 1911.

CARPENTER, F. B., B. S., County Agriculturist, Lewis & Clark County, Helena.
B. S., University of Minnesota, 1913.

CHASE, F. JOSIAH, B. S.....Farm Efficiency Specialist
B. S., University of Nebraska, 1914.

DAVIS, J. M.....County Agriculturist, Teton County, Choteau.

EVANS, AUGUSTA D., A. B.....Boys' and Girls' Clubs
A. B., Smith College, 1911.

HARTMAN, WILLIAM J., B. S. A.....Livestock Specialist
B. S. A., Ontario Agricultural College, 1907.

HILLMAN, F. M., B. S. Dairy Specialist
B. S., University of Minnesota, 1909.

JENSEN, KATHERINE, M S.....Home Economics Specialist
B. S., North Dakota Agricultural College, 1904; M. S., University of Illinois, 1912.

PETERSON, CARL H., County Agriculturist, Fergus County, Lewistown

PIPER, GEORGE E., B. S., County Agriculturist, Dawson County, Glendive.

B. S., Michigan Agricultural College, 1913.

TAYLOR, JOHN CHARLES, B. S., County Agriculturist, Custer County, Miles City.

B. S., Montana State College, 1912.

Standing Committees

ASSEMBLY.....Hamilton, A. H. Currier, Mrs. Herrick

ATHLETICS.....Swingle, Bennion, Tallman

BUILDINGS AND GROUNDS.....Linfield, Richter, Whipple

COMMENCEMENT.....Hamilton, Nash, Miss Baldwin

PUBLICATIONS.....Brewer, Atkinson, Cobleigh

REGISTRATION.....Ham, Miss Brewer, Holst

SCHEDULE.....Tallman, Cooley, Conkling

STUDENT AFFAIRS.....Miss Brewer, Spaulding, Mrs. Herrick, Whitcomb, Miss Cehrs.

RECOMMENDATIONS FOR POSITIONS.....Richter, Miss Harkins, Burke.

GRADUATE STUDIES.....Cooley, Atkinson, Thaler

ABSENCE COMMITTEE.....Atkinson, Mrs. Herrick, Richter

ELIGIBILITY.....Schoppe, Haines, Wilson

Experiment Station

In connection with the college, the Montana Agricultural Experiment Station is conducted. The object of this station is to further the interests of the agricultural industries of the State of Montana. This is done by conducting researches and experiments, which may include the physiology of plants and animals; the diseases to which they are severally subject, with remedies for the same; the chemical composition of useful plants at their various stages of growth; the various subjects connected with irrigation; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soil and water; the chemical composition of manures, natural and artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly upon the agricultural industry of Montana as may seem advisable.

The experiment station farm, consisting of 380 acres, adjoins the college grounds. It is provided with the necessary barns, granaries, tool houses, farm implements, livestock, gardens, greenhouses and orchards.

Sub-stations for experimental work in dry farming are maintained in various parts of the state and are conducted independently or in cooperation with the United States Department of Agriculture. A substation for experiments in horticulture has been established in the western part of the state.

The Montana Experiment Station is supported by the annual appropriations from the Federal Government under the Hatch and Adams Acts, supplemented by growing appropriations from the state.

The station issues during the year a series of bulletins, which put in practical form the results of the experimental work. These are sent upon request, to any citizen of Montana who will apply for them, and any such may have his name entered upon a mailing list and receive all bulletins as soon as issued.

Address, Director, Experiment Station, Bozeman, Montana.

Agricultural Extension Service

The purpose of agricultural extension service is to take agricultural science and experience out to farms and farm homes for the assistance of the people. The fruits of experiment and research; the formulated sciences of agriculture, biology, chemistry, physics and home economics as applied to country life, and the best farm experience are the foundation for this extension teaching. These are construed broadly to include the economic, business, social, educational, aesthetic, and ethical as well as strictly productive phases of country life. Home economics and household arts are included with agriculture in this extension service.

From a beginning with a single officer in charge of extension service and temporary assistance secured from the college, experiment station, and outside sources, a permanent division has been created with a director and assistants who are specialists in animal husbandry, home economics, horticulture, agronomy, rural education, and an office force. To this staff of extension workers for statewide service is being rapidly added a corps of county demonstrators in agriculture and home economics, whose work is personal and direct within a limited territory. These county demonstrators are working concertedly under direction of the State extension office in co-operation with the Federal agricultural organization. Members of the college faculty and experiment station staff devote a considerable time to extension service.

The extension equipment at present consists chiefly in a comprehensive agricultural library, stereopticon slides, charts, Babcock testers, and other illustrative and demonstrative material. For extension service in schools, at fairs, on better farming trains and elsewhere, the resources of the college and experiment station are freely drawn upon, Livestock, machinery, scientific apparatus, as well as agricultural, biological and chemical collections, are available for such instruction.

Among the more important lines of extension work are:

I. **Farmers' Institutes:** Meetings of farm people addressed by speakers of established reputation, for purposes of instruction and inspiration.

II. **Correspondence:** Instruction by mail, through the press, and by reading and correspondence courses. Reading matter containing information of current interest along the lines of agriculture and home economics is sent weekly to all the papers of the state.

III. **Movable Schools:** Located for the convenience of farmers for systematic instruction by qualified teachers. These schools each have the services of from four to six instructors and their average duration is one week.

IV. **Better Farming Trains:** Operated in co-operation with railroad companies. These trains carry several cars of illustrative and demonstrative material, and corps of fifteen to twenty instructors.

V. **Fairs:** The educational value of the country fair is being enhanced by trained judges furnished by the extension office and by demonstration exhibits.

VI. **High School Lectures and Lecture Courses:** Seventy-five to one hundred lectures in applied science given yearly to Montana high schools. Their purpose is to give instruction in agriculture, home economics, and applied science, adapted to pupils of secondary grade.

VII. **Rural Education:** Assisting the present educational system in co-ordinating rural education with country life, introducing agriculture into the rural curriculum, and enhancing the value of country schools.

VIII. **Industrial Clubs:** These engage boys and girls in practical enterprises, such as corn contests, potato contests, sewing contests, canned fruit contests, etc., etc. The winners in these county contests are taken to the state fair and entertained and taught under the supervision of college officers.

IX. **County Agriculturists:** In co-operation with the Federal government and counties of the State, agents are located to assist farmers personally in solving local problems of production, marketing, and country life. The extension service seeks to co-ordinate all forces that are at work for rural betterment, whether industrial, business, educational, social, or religious, and to co-operate with them for the greatest efficiency in such service.

Engineering Extension Work

The College of Engineering Extension Work has been inaugurated in order to give engineering instruction to those who desire information along engineering lines and who have not the time or the opportunity to attend the college. The courses, arranged so as to aid those engaged in practical work, consist of lectures, discussions recitations, drawing, etc. When a sufficient number apply for one or more courses, classes are organized and an engineering instructor visits the classes, once a week, to lecture or to conduct class recitations. In this way the student comes in direct contact with the instructor. Among the courses offered are the following:

I. **Shop Calculations:** Calculations of shop problems; size of gear, pulleys, etc.

II. **Drawing, Course 1:** Instruction in the use of instruments, lettering and projections.

III. **Drawing, Course 2:** Development of surfaces and the drawing of simple machine parts.

IV. **Design of Simple Structures:** Determination of stresses in simple structures, including the design of a simple truss in wood and steel. Especially adapted to the needs of carpenters, builders and contractors.

V. **Valve Gears:** A study of valve movements as applied to locomotive and other engines. The Zeuner diagram.

VI. **Electrical Machinery:** Direct currents, a study of the construction and operation of direct current machinery.

VII. **Electrical Machinery:** Alternating currents, a study of the construction and operation of alternating current machinery.

VIII. **Heat and Steam:** Nature of heat, use of steam table, efficiency of the perfect engine, compounding, jacketing, superheating.

IX. **Internal Combustion Engines:** Gas, gasoline and producer gas engines, gas producers.

State College of Agriculture and Mechanic Arts

The Thirteenth Legislative Assembly passed an Act which provides that the State University at Missoula, the College of Agriculture and Mechanic Arts at Bozeman, the School of Mines at Butte, and the Normal College at Dillon shall constitute the University of Montana. The control and supervision is vested in the State Board of Education, which appoints the president, faculty and such other officers and employees for each of the various institutions of the University of Montana as the said Board may deem necessary. Degrees and diplomas shall run from the University of Montana and must specify substantially the course of study which the graduate has completed.

The purpose of the colleges of agriculture and mechanic arts is chiefly to provide industrial education in agriculture, engineering, household economy, and applied science, for the young men and women of the respective states in which they are located. The scope of the Montana State College is set forth in the two so-called Morrill Acts of Congress, which authorized this class of institutions and supplied in part endowment and funds for maintenance; and in an act of the Montana Legislature accepting the land and money grants from the national government.

The first Morrill Act of Congress of July 2, 1862, making a land grant for the partial endowment of the agricultural and mechanical colleges, states that the income from these lands shall be used to maintain colleges" where the leading object shall be, without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislators of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

The second Morrill Act of Congress, August 30, 1890, making an annual appropriation out of the treasury of the United States for the further support and endowment of these colleges, provides that this fund is "to be applied only to instruction in agriculture and mechanic arts, the English language, and the various branches of mathematical, physical, natural and economic sciences, with special reference to their application to the industries of life; and to the facilities for such instruction."

The Act of the Montana Legislature, approved February 16, 1893 accepts these grants of lands and money and provides that the Montana State College shall have for its object, "Instruction and education in the English language, literature and mathematics, civil and mechani-

cal engineering, agricultural chemistry, animal and vegetable anatomy and physiology, the veterinary art, entomology, geology, and such other natural sciences as may be prescribed by the State Board of Education; political, rural and household economy, agriculture, horticulture, history, bookkeeping, and especially the application of science and the mechanical arts to practical agriculture in the field, and irrigation and the use of water for agricultural purposes."

ENDOWMENT.

The Enabling Act, providing for the admission of Montana into the Union, approved February 22, 1889, Sec. 16, grants 90,000 acres of land to Montana for the use and support of an agricultural college according to the terms of the Act of Congress, July 2, 1862, and Sec. 17 grants an additional 50,000 for the same purpose, and subject to the same conditions and limitations as the other grant. The 140,000 acres of land cannot be sold for a price less than $10.00 per acre, and the principal, together with all money received from the sale of timber, is to be invested as a permanent endowment. The unsold lands may be leased and the rentals, together with the interest on the permanent endowment, shall be used for the maintenance of the college.

The Act of Congress of August 30, 1890, appropriates $25,000 annually out of the treasury of the United States. By the Nelson bill, passed March 3, 1907, this amount was increased annually by $5,000 each year, beginning in 1907, until now the total annual appropriation has reached $50,000, at which figure it is to remain.

LOCATION

Bozeman, the county seat of Gallatin county, is on the main line of the Northern Pacific railroad, and on a branch of the Chicago, Milwaukee and Puget Sound railroad. For convenience, healthfulness and beauty of surroundings, the location is unsurpassed. The college is situated on an elevation which commands a view of one of the most fertile valleys in the world, covered far and wide with grain fields, and hemmed in on all sides by lofty mountains.

Bozeman is a city of homes and churches, with a wholesome moral enviroment. It is a most desirable residence city for families who wish to educate their children. Expenses are moderate and there are all the conveniences of a modern city. The college is reached from the railroad stations and city by the electric car line.

CAMPUS AND FARM.

The grounds and farm contain four hundred acres. Forty acres in the immediate vicinity of the buildings constitute the campus and recreation grounds, which are in lawn, interspersed with flower beds, shrubbery, trees and driveways. The remainder is used for farming and experimental purposes.

BUILDINGS.

Montana Hall. Situated in the center of the college campus, is a substantial structure of brick and stone, having a total length of one hundred and twenty-eight feet and width of ninety feet. It is three stories high, and has a basement, which furnishes quarters for mechanical drawing and two class rooms. On the first floor are offices for the president, secretary and registrar, one room each for the Young Men's and the Young Women's Christian association, a class room, and the south half of the first floor contains the reading room and library, and an office for the librarian. The north half of the second floor is devoted to the art department, the arrangement being such that three large rooms can be thrown together by sliding doors. The south half of the second floor has one office and four recitation rooms. The third floor contains the large assembly hall and seven class and music rooms.

Hamilton Hall. The dormitory for women. It was named by the faculty for the late Mrs. James M. Hamilton. It is one hundred twenty by fifty-eight feet, three stories and basement. It is constructed of brick with hard wood floors and Oregon fir finish. It is equipped with steam heat, electric lights and baths. The rooms are single and in suites, and all rooms have both hot and cold water. In the basement are the store rooms, laundry, quarters for servants, kitchen and large dining room. The first floor contains the reception rooms, the dean's suite, guest room and a number of rooms for students. The second and third floors are for students.

Agricultural Hall. A three-story building, one hundred and fifty feet by sixty-eight feet, pressed brick, tile roof, maple floors and modern equipment throughout. The north half of the first floor contains the quarters for dairying, consisting of storerooms, office, class room, butter and cheese rooms and laboratories. The south half of this floor is used for horticulture and has seed room, office, class room, work room and laboratory. The north half of the second floor is occupied by the agronomy department, with office, class room, dry land office, soil and grain laboratories. In the south half are offices for the director of the experiment station, superintendent of farmers' institutes, class room, office and laboratory for the department of animal industry. The third floor is devoted to home economics, and contains two large kitchen laboratories, two dining rooms, two class rooms, three sewing rooms, offices and one room for training in nursing.

Adjoining the Agricultural Hall on the south is the greenhouse with iron frame, cement floors and modern construction throughout. In the center of the front is a palm room thirty-nine feet square and on both sides flower and vegetable rooms, twenty-eight by twenty-five feet. Through the center is a plant breeding room, ninety-eight by twenty feet, and on the west side a propagating room, ninety-eight by nine feet. The entire house is ninety-eight by sixty-eight feet, and joined to the agricultural building by a brick work room, fifty-seven by ten feet.

Chemistry and Physics Building. Located west of Montana Hall. It is sixty by one hundred feet, of pressed brick, and is three stories high including the basement. The basement is occupied by the physics lecture room, chemistry lecture room, and laboratory, the mineralogical and assay laboratory, and the museum of geology and mineralogy. The main floor is occupied by the office and department library, a lecture room, the food laboratory and the experiment station laboratory. The east half of the second story contains the laboratories for physics, and the west half the qualitative and quanitative laboratories.

Biology Building. Consists of three stories and basement and is brick veneered. On the top floor is a lecture room and a museum containing the zoological collections. On the floor below are three laboratories for bacteriology, botany and zoology, and an office and work room for the botanist. The west half of the first floor is a large laboratory for general biology, and the east half is occupied by the office, library and work room for the entomologist. The basement contains work rooms, class room, store rooms, herbarium room, and dark room. Attached to this building on the south is a greenhouse, seventy-two by fifty feet, for botanical purposes, and an insectary, eighteen by ten feet, for the study of living insects. The greenhouse is divided into two rooms, one for experimental work and the other for laboratory use.

Engineering Laboratory. A two-story building ninety-four by thirty-five feet, with a frame annex thirty-six by twenty feet. The first floor contains the dynamos, motors, and other machinery and apparatus, offices and students' reading room. The second story is occupied by the storage battery, photometer and electric light rooms, class rooms and offices. The first floor of the annex contains the cement laboratories, and the second floor is used for electrical designing. There is also laboratory space forty-three by one hundred and forty-four feet, occupied by materials testing machines, a refrigerating machine, various steam and gas engines, steam and oil tractors, etc. Adjoining the laboratory on the west is a brick building, seventy-six by thirty-two feet, used as a heating plant for the college.

Shops. A one-story frame building sixty by one hundred feet, contains a forge shop, twenty-seven by sixty feet, a machine shop forty-four by seventy-two feet, an office, a wash room, and a tool room. It has one wing thirty-six by fifty feet for woodwork, and another thirty-six by forty-eight feet for foundry.

Gymnasium. A frame building one hundred by sixty feet, has hard wood floor, and on the ends and sides are permanent seats, amphitheater style. It furnishes a convenient place for gymnasium practice, basketball and other indoor athletics. An addition at the rear and sides, ninety by fourteen feet, provides a director's office, two locker

rooms, dressing room for women, shower and needle bath rooms, and a material room.

College Farm Buildings. There are eight buildings located on the college farm adjacent to the campus, the cattle barn, veterinary building, horse barn, beef cattle barn, sheep barn, seed barn and granary, the piggery, and poultry plant.

HAMILTON HALL.

Hamilton Hall is the college home for women. This building is completely furnished. All modern conveniences, such as hot and cold water in the rooms, baths, steam heat and electric lights, are furnished. The Hall is under the supervision of the dean of women and the residents have the care and training necessary for a family of students. The price of rooms (including board) varies according to location and size of room:

ROOM AND BOARD

One in single room	$24.00
Two in single room (each)	22.50
One in double room	26.00
Two in double room (each)	23.00
Two en suite (each)	26.00
Three en suite (each)	24.00

The above prices are for a calendar month. Of these amounts $18.00 is for table board and the remainder for room rent. Application for rooms in the hall may be made at any time to the dean of women, or to the secretary of the college and must always be accompanied by a deposit of $5.00 to insure a reservation. This amount will apply toward payment of bills in the fall or will be returned if the secretary is notified before September 1. Residents who leave the Hall before the close of the semester will be required to pay the room rent till the end of the semester. Payment for room and board must be made on the fifteenth of every month in advance, and after five days thereafter an extra charge of $1.00 per week will be made as long as the bill remains unpaid, unless arrangements have been made to defer payment. Complete arrangements are made for the reception of the residents the day before registration day, and no deduction will be made for late arrivals. The Hall will not be opened for occupancy until the day before registration day. No deduction is made for absence at week ends or during vacations, except at the Christmas holidays, when room rent only will be paid. The residents may have guests at meals by making arrangements for same at the dean's office, the day before, and may also have the privilege of the laundry on Saturdays by paying a small fee. The residents are expected to furnish their own towel supply, dresser and table scarfs, and have same laundered; also a napkin ring and any room decorations they may fancy.

ROOM AND BOARD FOR MEN.

There is no men's dormitory connected with the college. Students who do not live in Bozeman find room and board in private families convenient to the college, at from $22.00 to $25.00 per month. The total college expense for the year, including tuition, books, room, board and incidental expenses may be estimated from $250.00 to $350.00. A list of approved places with prices and accommodations is kept in the registrar's office. A committee of students meets all trains on registration days and at other times on request, and aids in finding satisfactory locations. Students arriving in Bozeman in the day time should take the car from the depot to the college.

FEES*

1.—Annual matriculation fee for college, and school of home economics and mechanic arts courses	$15.00
2.—Annual matriculation fee for school of agriculture and other three-year courses	10.00
3.—Extra fee for late registration	$2.00 or 4.00
4.—Special fee for removing condition caused by absence	2.00

DEPOSITS*

Agriculture—Agronomy (1), (11) per semester	$ 1.00
Agronomy (2) per semester	2.00
Animal Husbandry (1) per semester	.50
Animal Husbandry (g), (h) per senmester	1.00
Dairy Husbandry (1), (2), (a), (b) per semester	2.00
Horticulture (1) per semester	1.50
Horticulture (4) per semester	5.00
Horticulture (6) per semester	1.00
Veterinary Science (51) per semester	2.00
Art—Art (1), (1a), (1b), (2), (2a), (3), (3a), (4), (7a), (7b), (7c). (8a), (8c), (9), (15), (16), (17), (18a), (18b), per semester	.50
Art (7), (8), (8b) per semester	1.00
Art (10), (11), (12) per semester	5.00
Art (13), (14) per semester	3.00
Botany and Bacteriology—Botany (c) per semester	1.50
Botany (1) per semester	2.00
Botany (2), (4), (11) per semester	3.00
Botany (3) per semester	6.00
Botany (12) per semester	7.00
Chemistry—Chemistry (1) per semester	8.00
Chemistry (7) per semester	10.00
Chemistry (3), (4), (5), (8), (14), (17), (18) per semester	8.00
Chemistry (11), (12) per semester	6.00

Engineering—C. E. (1), (1a), (2), (4), (9), (14), (15), (21), (28), (29), (30), (32) per semester	1.50
C. E., (8), (34) per semester	2.00
E. E., (4), (6), (10), (12) per semester	3.50
M. E., (6), (15a), (17), (21), (27) per semester	2.00
M. E., (4) per semester	1.50
M. E., (2), (9) per semester	2.50
M. E., (2a) per semester	1.00
M. E., (20), (28) per semester	5.00
M. E., (32), (33) per semester	3.00
A. E., (4), (6), (7) per semester	1.00
Home Economics—H. E. (1), (5), (6), (20) per semester	4.00
H. E., (2), (4), (h) per semester	5.00
H. E., (13), (c), (b), (19) per year	1.50
H. E., (16), (d) per semester	.75
H. E., (3), (7), (12), (14) per semester	.50
H. E., (8) per semester	1.25
H. E., (g) per year	6.00
H. E., (11), (11a) per semester	2.00
H. E., (a), (17) per semester	1.00
H. E., (h) per semester	5.00
H. E., (j) per year	.50
Mechanic Arts—M. A., (e) per year	4.00
M. A., (b) per semester	5.00
M. A., (c), (r) per semester	2.00
M. A., (d), (h) per year	3.00
M. A., (f) per year	4.50
M. A., (s) per semester	3.00
M. A., (a) per semester	4.00
Physics—Physics (a) per year	1.00
Physics (la) per semester	2.00
Physics (2) per year	3.00
Physics (4), (9) per semester	2.00
Physics (5) per semester	3.00
Typewriting (3) or (4) for use of machine for one year	5.00
Zoology and Entomology—Zoology (1), (2), (3), (8) per semester	3.00
Zoology (4), (5), (6), (7) per semester	2.00
Zoology (10) according to work prescribed, per semester—	2.00 to 10.00

*A fee is a fixed charge and no part is returned. The deposits cover the cost of materials and breakage in the laboratories and any unused balance is returned.

ADMISSION.

Admission to the freshman class, in any of the college courses, is granted: (a) By a certificate of graduation from an accredited high school, (b) By examination in the subjects required by the college for entrance. (c) By faculty approval of grades from other than accredited high schools. (d) By graduation from the school of home economics and mechanic arts.

Candidates for admission to the school of home economics and mechanic arts and the school of agriculture must have completed the eighth grade in public schools or its equivalent. There are no set requirements for music and the short agricultural courses, all being admitted who give evidence of being able to profit by the work. All candidates for admission to the institution in any department whatever are required to present the requisite diplomas or certificates for work previously done in other schools, and no registration is complete until such credentials are presented and passed upon.

ENTRANCE REQUIREMENTS.

Fifteen units are required for admission to the freshman class in any college course.

Any one with not less than thirteen units may be admitted conditionally, but the units of preparatory work which have not been offered at entrance must be given preference over college subjects.

A unit for admission shall consist of work to the amount of five recitation periods per week of forty-five minutes each or four recitation periods per week of sixty minutes each, for a year of not less than thirty-six weeks.

Two periods of laboratory, shop work, or drawing shall count as one recitation.

In accordance with the present rules of the State Board of Education the following are required of all applicants for admission without condition to the freshman classes:

1—English composition and literature, 3 units.

2—Mathematics, 2 units.

3—Science, 1 unit.

4—History, 1 unit.

The remaining units will be selected from the following:

1—Language other than English, 6 units.

2—Mathematics, 2 units.

3—Science, 3 units.

4—History, including civics and economics, 3 units.

5—Drawing, 2 units.

6—Commercial subjects, 4 units.

7—Industrial subjects, including home economics, mechanic arts and agriculture, 6 units.

Admission without condition to the courses in engineering requires three years of mathematics and one year of physics.

REGISTRATION.

Matriculation.—Students entering the college for the first time must present their credentials or pass examination to determine their standing; and until such credentials are passed upon by the registrar or until examinations are passed in the subjects which may be required, the applicant for admission will ordinarily not be admitted to class work. This means that graduates of accredited high schools must bring to the college a recommendation certificate (forms will be furnished by the registrar), showing just what subjects credit is asked for, just how much time was given to such subjects and the grades attained. In addition to this, graduates from high schools not accredited may be required to pass examinations in the subjects offered. In the case of graduates from the eighth grade of the common schools, the certificate of examination must be brought to the college.

Time for Registration.—The time set for registration of students is the first Monday and Tuesday of the first semester, and the first Tuesday of the second semester. The class room work begins on the first Wednesday morning of each semester. No students will be registered on Wednesday, Thursday of Friday of the first week of each semester, except at the convenience of class officers between four and five in the afternoon. Those who fail to present themselves for registration before the first Wednesday in either semester, will be permitted to register later in the first week, only upon the payment of a special fee of $2.00, in addition to regular fees. Those who apply for registration after the end of the first week of each semester will be registered only upon payment of a special fee of $4.00 in addition to the regular fees. All special fees so collected shall go into the miscellaneous college fund. The faculty may at its discretion refund the special fee of any student, after the third month of the semester, upon definite proof that the tardy registration was necessary.

Amount and Regularity of Work.—Students under twenty-one years of age will be admitted only to regular courses or to work as nearly regular as their preparation allows, unless on special action of the faculty. Students over twenty-one will be admitted to such work, not less than twelve credits (allowance being made for music), as the schedule permits and their class officers approve, and the twelve credits, shall include at least six credits of lecture or recitation work.

Change of Registration.—A student desiring to change his studies will present his request to his class officer, who, after consulting all teachers interested, will take such action as he may deem best. Change in registration will be made after four weeks for extraordinary reasons only. Requests for change in registration will not be considered during the last eight weeks of a semester. A change in course of study is allowed by a vote of the faculty only.

Credits Necessary for Registration.— It is the sense of the faculty that any student not passing ten credits is wasting his time, and ordinarily he will not be re-registered when he has failed to pass in ten credits the preceding semester.

Registration by Mail.—Most of the details of registration can be arranged in advance by mail, and students are requested to arrange their work so far as possible in this way. Those who enter the institution for the first time should write several days in advance of the college opening, enclosing their credentials, as specified in the paragraph on matriculation above, to the registrar of the college, and should state the work which they wish to take. These documents will be examined and the student's classification ordinarily be determined before his arrival, so that much time in registration may be saved. Those who have been already enrolled in the institution should send a letter to their class officer several days in advance of the registration days, telling clearly the work which they plan to take, and in case of elective subjects, stating briefly the reasons for their choice.

If these steps are taken by students, registration should be completed with a minimum expenditure of time; but no student's registration will be complete until he applies at the college in person.

Students who plan to arrange their registration by mail, as specified above, should study carefully the entrance requirements for the courses in which they are interested, and the prerequisites to the various subjects which they wish to take.

Absences.—Students absent from required exercises are reported at the close of each day to the registrar's office.

In case of absence students must appear before the class attendance committee and be given an absence excuse card before being admitted to the class the second day after the absence occurs. In the case of frequent, unwarranted absences, the committee shall bring the case before the faculty for discipline.

The committee, or one of its number, meets daily, except Saturday, between the hours of 3:50 and 4:10 p. m. at the office of the registrar for the purpose of considering absences.

These regulations apply to all students in the institution below the grade of junior.

Class absences of juniors and seniors will not be reported until the instructor feels that members of these classes are willfully remaining away from class and so wasting their time, and then these are to be reported to the absence committee for consideration and discipline recommendations to the faculty. The instructors deal with tardiness in such manner as they deem best.

Leave of Absence.—When it is necessary for a student to be absent from the city, application must be made to the president for leave of absence. A leave of absence is justification for absence from class, but does not give relief from the work omitted.

GRADES

Passing Grades.—Passing grades are marked A, B, C, or D. An average standing from 90 to 100 is A, from 80 to 90 is B, from 70 to 80 is C, and from 60 to 70 is D.

Conditions and Failures.—Work not of a passing grade shall be marked E, if in the judgment of the instructor it can be made up or completed without repeating the course in class. Work not of a passing grade shall be marked F, if in the judgment of the instructor it cannot be made up or completed without repeating the course in class. A mark of E is a condition and may be removed by an examination or in such other manner as the instructor may prescribe. Examinations for removing conditions shall be held on the days designated in the college calendar. A mark of F is a failure and must be made up by repeating the subject in class. When a condition is not removed by the time the subject is offered the following year it lapses into a failure. The above marks apply to laboratory, shop work, drawing and other exercises, as well as to lecture and recitation courses.

Students whose work is unsatisfactory will be reported to the class officer and the president, and information will be sent to the parents or guardians.

Credits.—For convenience in estimating the requirements for a degree, the following rules are laid down: One hour a week, for a semester, of recitation or lecture work, two or two and one-half hours a week for a semester of laboratory, shop, library work, or drawing, shall count as one credit.

If for any reason the full time is not occupied in the shop, laboratory, drawing room or library, the remainder shall be used under the supervision of the instructor for outside work.

No regular student may take in any one semester work amounting to less than twelve credits, nor more than nineteen, unless a greater number are prescribed in the course.

Grades brought by a student from another institution will be accredited in this college only after personal conference with and approval by the head of the department in which credit is desired. Students must present note books for work in which they have had laboratory courses and desire advance credit.

GRADUATION AND DEGREES.

Bachelor's Degree.—Candidates for the bachelor's degree must complete satisfactorily one of the college courses as outlined and not less than 130 credits; including also a thesis the value of which in credits shall be determined by the instructor concerned. Students who are relieved for any reason of the requirements in military drill or physical education shall present four additional credits in some other subjects.

The degree of Bachlor of Science is conferred upon students completing the work prescribed in any one of the college courses and the name of the course taken is placed on the diploma.

In order to complete a course satisfactorily and receive a degree a student must earn as many points as there are credits in the course. In calculating points, A grades counts three times as many points as credits, B grades two times, C grades only one and D grades zero.

All students whose points are two and one-fourth times the number of credits at the time of graduation will receive the degree "With Honors".

Master's Degree.—Master's degree work is offered by some departments of the college, and may be arranged by conference with the professor in charge. For admission the candidate must hold a Bachelor's Degree from this college or another of at least equal rank, and in the line of work for which he applies for Master's Degree, he shall have sufficient preparation in his major subject to enable him to carry on independent investigations. He shall complete a full year of resident study.

There shall be one major subject and one or two minor subjects. At least one-half of the work must be done in the major subject. The plan of the work must be approved by the Faculty Committee on Graduate work by October 1. The candidate shall also present a thesis embodying the results of independent investigation, which may be a part of the credits required for the major subject. He shall also pass an oral examination on his graduate work before a committee of not less than five members representing the departments offering his major and minor subjects and two or more allied departments.

Engineering Degrees.—Resident graduates in engineering may earn the degree of Civil Engineer, Electrical Engineer, or Mechanical Engineer on the same basis as candidates earn the degree of Master of Science. Non-resident graduates in engineering must have at least three years of successful professional experience, must present an acceptable thesis, and must pass an examination before the special committee on degrees.

MISCELLANEOUS.

Government—Students are expected to conduct themselves as ladies and gentlemen; those who fail to comply with this demand will be requested to leave the institution.

Work for Exhibition.—It is required that students who have done work suitable for exhibition purposes shall place such work at the disposal of the institution for the period of one year.

Student Organizations.—All public performances, given by students or student organizations, using the name of the college, will be under the supervision of the committee on student affairs.

So far as possible all college gatherings will be held on Friday

and Saturday evening. This includes class and student organizations. Students will not be out evenings from Monday to Friday except to attend something of unusual interest and value.

Eligibility for Athletics.— The rules governing eligibility of players shall be the same for all athletic contests in which any team plays an officially scheduled contest under the name of the college, whether the game be with another college, a club, or a secondary school. Each student representing this institution in intercollegiate contests must be pursuing regular work in this institution, and must be passing up to the week of the contest in at least twelve credit hours.

Military Drill.—All male students, except aliens, those physically disqualified members of the junior and senior classes, and student assistants, are required to take military drill, satisfactory work being requisite for graduation.

Military drill is in charge of a United States army officer and a minimum of two years' drill is required. Each student in military drill must provide himself with a uniform, which is purchased through the secretary of the college, and costs about fifteen dollars.

If military drill is not given, physical education (1) will be required of all freshmen, and physical education (3) of all sophomores.

Students who are relieved for any reason of the requirements in military drill or physical education shall present four additional credits in some other subject; but the president may, at his discretion, excuse from such requirement any student in the employ of the institution.

Assembly.—Students are required to attend the assemblies held on the second and fourth Fridays of each month and all special assemblies. The programs at these assemblies consists of addresses, music recitals, illustrated lectures, etc. Meetings of student organizations are held on the first and third Fridays of each month.

Honorable Dismissal.—Students intending to sever their connection with the instutition, either indefinitely or permanently, should report as soon as possible to the president, either in person or in writing, giving proper explanation, and should apply for an honorable dismissal. Students leaving the institution without such honorable dismissal (except at the end of the college year), will not be readmitted to the college at any later time, nor will any reports or grades in credit for work done here be sent out until satisfactory explanation is made.

COLLEGE ORGANIZATIONS.

Young Men's Christian Association.—The association is undenominational and is well fitted to promote the moral and deligious life of students. It conducts mission and Bible study courses, and prayer meetings and secures addresses by religious workers. The associa-

tion promotes good fellowship by giving social entertainments, assists new members to get started in college life and aids in securing employment for those who wish to work their way through college.

Young Women's Christian Association.—The object of this association is the symmetrical development of Christian womanhood and the rendering of social service. To this end it conducts devotional meetings, Bible and mission study classes, and carries on an employment bureau for college women; homes are found where college women may receive their board and room in return for their services. This work is being standardized and will be supervised by the home economics seniors of the Y. W. C. A. The Y. W. C. A. co-operates with the Y. M. C. A. in social and religious work among the students. Each year it sends delegates to the Northwest Conference and keeps in touch with the state, national and international associations.

Debating Council.— The management of the work in inter-class and intercollegiate debating, in extemporaneous speaking, and in oratory, is now vested in a debating council, which works in co-operation with the department of English. There is an established debate each year between the freshman and sophomore classes. There is a state contest in oratory and extemporaneous address in which five institutions of the state participate.

The Exponent.—The students of the college maintain an excellent weekly paper, The Exponent, which has also a monthly literary supplement. The paper is well supported by the students and outside advertisers and has become one of the most important and successful of student enterprises. It compares favorably with the best college publications in the United States and affords the members of the staff very valuable literary training.

Athletic Council.—This organization, composed of representatives from the faculty and student body has general control over all branches of athletics. Football, basketball, baseball, track and tennis are at present recognized.

Branch of the American Institute of Electrical Engineers.—A branch of this society has been organized at the college. Regular monthly meetings are held at which original papers are read or those of the Institute discussed. Students and teachers are kept in touch with practical engineers and their problems. Only regular members or student members of the American Institute are eligible to membership in this branch. There is, however an Electrical Club, which includes all the members of the Institute and all other students in the electrical engineering course.

The Civil Engineering Society.—The students of the department of civil engineering organized this society for the purpose of promoting their interests in matters of practical importance to engineering stu

dents and alumni. Prominent engineers who have succeeded in special fields frequently meet with the members of the society to discuss the problems of their field. Meetings are held bi-monthly.

College Band.—The college band, of forty-five members, is one of the best amateur musical organizations in the state. The college provides instruments, music and instruction. The band is divided into two sections, beginners and experienced players. This gives a splendid opportunity for those who have never played and those who have some skill in the use of instruments.

Glee Club.—Men students who have the necessary range and quality of voice are admitted. Music and instruction is free. Rehearsals are held twice a week under the direction of the instructor of vocal music. College and home songs as well as the works of the foremost American composers are studied.

Treble Clef Club.—This club consists of sixteen voices, otherwise it corresponds with the Male Glee Club. The same type of music is studied, and the rehearsals are held twice a week. Twice a year the clubs appear in joint concert, performing the works studied, and forming also a mixed chorus. Separate public appearances are frequent.

Orchestra.—The orchestra is an organization composed of students of the college. The membership numbers about twenty and the club meets twice a week for practice. Some light symphonies are worked out by the orchestra during the year.

Agricultural Society.—All agricultural students are eligible to membership in this society. Regular meetings are held for the discussion of topics of interest in scientific agriculture with special reference to the possibilities of farm life.

Home Economics Club.—This club is composed of women students who are working for a degree in home economics. Meetings are held twice a month for the discussion of topics of interest to students in home economics and also to keep in touch with the work of the alumni of this department.

The Chemical Society.—The students taking the chemistry course join this society for the purpose of developing an interest in the professional side of the subject and also for studying topics that do not come up in regular class work. Regular meetings are held and abstracts of recent journal articles are presented.

The Alumnae Club.—The active members of this organization are women graduates, residing in or near Bozeman; the associate members are the undergraduate women. The object of the club is to promote the interests of college women.

Social Clubs.—Greek letter fraternities are not permitted. Clubs which have for their object the improvement of the social life of their members are authorized. Clubs of this kind for men are the Triangle X, the K. N., and O. B. Each maintains a house in which its members live. Three clubs are maintained by college women, the Keseke, Tripple "S", and Annevus. These clubs, like other student organizations, are under the supervision of the faculty.

CONTESTS.

Prize in Oratory.—An annual prize of twenty dollars is given to the winner of the annual local oratorical contest. This is open to all students. The winner represents the college in the state oratorical contest.

Armstrong Prize in Declamation.—Hon. F. K. Armstrong of Bozeman, gives a prize of ten dollars to the winner of the annual declamatory contest of the secondary schools. There is also a second prize of five dollars. Only regular students are eligible.

Extemporaneous Speaking.—Hon. Nelson Story, Jr., gives an annual prize of twenty-five dollars toward an Extemporaneous Speaking Contest. Fifteen dollars is given as first prize, and ten dollars as second prize. This contest is open to all regular students of the secondary schools.

SCHOLARSHIPS.

The State Board of Education has established a four-year scholarship in each of the accredited high schools for the student who receives the highest average grade in his class. These scholarships are awarded each year by the high school principals for their respective schools. This scholarship excuses the holder from paying the tuition fee. Any one winning a scholarship may choose any of the state institutions.

Federation Scholarship.—The State Board grants to the Montana Federation of Women's clubs a scholarship in each of the four state colleges each year. The Federation pays all college expenses of the woman elected, including board, room rent, books, athletic ticket and gymnasium suit.

ACCREDITED HIGH SCHOOLS.

Following is a list of the four-year accreited high schools of the state:

(1) **City High Schools.**—Anaconda, Belt, Billings, Butte, Belgrade, Baker, Bridger, Corvallis, Columbia Falls, Culbertson, Cutbank, Chinook, Columbus, Conrad, Eureka, Forsyth, Fromberg, Glasgow, Great Falls, Hamilton, Havre, Helena, Harlowton, Hysham, Joliet, Laurel, Libby, Moore, Manhattan, Plains, Pony, Polson, Roundup, Shelby, Sidney

Stanford, Stevensville, Sheridan, Terry, Thompson Falls. Three Forks, Victor, Virginia City, Valier, Whitehall, Whitefish, White Sulphur Springs, Worden.

(2) **County High Schools.**—Beaverhead, Dillon; Broadwater, Townsend; Choteau, Ft. Benton; Carbon, Red Lodge; Custer, Miles City; Dawson, Glendive; Fergus, Lewistown; Flathead, Kalispell; Gallatin, Bozeman; Granite, Philipsburg; Jefferson, Boulder; Missoula, Missoula; Park, Livingston; Powell, Deer Lodge; Sweet Grass, Big Timber; Teton, Chouteau; Wibaux, Wibaux.

(3) **Parochial High Schools.**—Central High School, Butte; Mount Angela Ursuline Academy, Great Falls; Sacred Heart Academy, Missoula; St. Vincent's Academy, Helena.

(4) **Other Schools.**—Academy of the College of Montana, Deer Lodge; High School Department of the Butte Business College, Butte.

EMPLOYMENT FOR STUDENTS

A number of students earn a part of their expenses while in college. Students expecting to work their way should come with sufficient money to pay their expenses for one semester unless they have engaged work in advance. The college cannot guarantee employment, but hose who are willing to give efficient faithful service have usually found work.

A few students are employed as janitors and as assistants in the shops, laboratories and barns. Others care for furnaces, horses and cows in the city, work in stores and at various kinds of house work. Calls for young lady students to work for their board are numerous.

Students readily find employment at profitable wages during the summer vacation.

Engineering students are placed with the reclamation service, the railroads, and the electric power plants.

A faculty committee aids students to find employment. Those desiring work should write, stating experience and kind of work desired.

LIBRARY AND READING ROOM.

Public Depository.—By Act of Congress the library is now a depository and receives all public documents and other printed matter issued by the United States government.

Main Library.—The library occupies the south half of the first floor of Montana Hall. It contains 13,588 volumes, not counting public documents, and about 6,000 pamphlets. It is well supplied with standard works in technology, history, science and literature, as well as with dictionaries, cyclopedias and other reference works.

Department Libraries.—The agricultural library occupies two rooms on the first floor of the Agricultural Hall. It contains almost complete bound sets for all state experiment station bulletins and

United States Department of Agriculture publications, besides a large number of agricultural papers and standard works. One room on the first floor of the biology building is used for the library and periodicals of the biological department. The library of the chemistry department is located in the basement of the chemistry building. At the east end of the engineering laboratory is a large library and reading room for engineering students.

BASKET BALL TOURNAMENT, SPEAKING CONTEST, AND ESSAY CONTEST.

The annual high school basket ball tournament, speaking contest and essay contest is held on Thursday, Friday, and Saturday nearest the tenth of March. An invitation is extended to the sixteen high school basket ball teams, who have, through intra-district competition, proven their superiority. Significant school trophies are presented to the best teams, and suitable individual awards are given to the team members. In connection with the tournament an extemporaneous speaking contest, and essay contest is held.

ORGANIZATION OF INSTRUCTION.

A. The following four-year college courses, each leading to the degree of Bachelor of Science, are offered:

1.—College of Agriculture.
(1) Agronomy; (2) Animal Industry; (3) Horticulture; (4) Dairy.

2.—College of Engineering.
(1) Civil Engineering; (2) Electrical Engineering; (3) Mechanical Engineering; (4) Chemical Engineering; (5) Architectural Engineering; (6) Irrigation Engineering.

3.—College of Applied Science.
(1) Botany and Bacteriology; (2) Chemistry; (3) Industrial Chemistry; (4) Zoology and Entomology.

4.—College of Industrial Arts.
(1) Home Economics; (2) Applied Art; (3) Secretarial Work.

B. The following courses, not leading to a bachelor's degree are offered:

1.—Summer Session.
2.—School of Home Economics.
3.—School of Mechanic Arts.
4.—School of Agriculture.
5.—Secretarial Work.
6.—Music School.

NOTATION.

The Arabic numbers used in the tables and in the description of the courses indicate the number of credits toward graduation allowed for the subject. In the description of the courses Yr. indicates that a course is given throughout the year, and the Roman numerals, I. and II. are used to designate the first and second semesters.

College of Agriculture

This College includes four courses, viz, Agronomy, Animal Industry, Dairy, and Horticulture. For the first two years the work is the same in all three courses. At the beginning of the junior year the student chooses the group in which he desires to specialize. The aim of this work is to give a thoroughly practical course based on a broad, scientific foundation, along the lines of field agriculture, horticulture, livestock, dairying and poultry.

The college is very completely equipped for agricultural instruction. A large agricultural building, thus centralizing the work, a one thousand-acre farm, a large orchard and garden, large and well equipped laboratories for the study of soils and crops, for milk testing and dairy manufacturing and for the study of farm machinery, a large greenhouse well stocked with plants, and several barns and other buildings filled with various breeds of livestock, including beef and dairy cattle, horses, sheep, hogs and poultry—all these are at the command of the agricultural student.

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
General Botany (Bot. 1)	5	Gen. Des. Physics (Phys. 1a)	5
Trig. and Log. (Math. 2a) —or— Applied Algebra (Math. 7)	3	Prin. Plant Production (Hort. 1)	3
Farm Dairying (Dairy 1)	3	Animal Types (An. Husb. 1)	3
Drill or Physical Education	1	Drill or Physical Education	1
	19		19

SOPHOMORE YEAR.

Expository Comp. (Eng. 2)	2	Expository Comp. (Eng. 2)	2
Organic Chemistry (Chem. 5)	5	Agricultural Chem. (Chem. 7)	5
Field Crops (Agron. 1)	4	Forage Crops (Agron. 11)	4
Fruit Growing and Gardening (Hort. 10)	4	Vet. Anatomy and Physiology (Vet. Sci. 51) —or— Entomology (Zool. 4)	4
Invertebrate Zoology (Zool. 1)	3	Geology (Geol. 1)	3
Drill or Physical Education	1	Drill or Physical Education	1
	19		19

Note—Animal husbandry and dairy husbandry students will take veterinary anatomy and physiology (Vet. Sci. 51) and agronomy and horticultural students will take entomology (Zool. 4).

COURSE IN AGRONOMY

JUNIOR YEAR

First Semester		Second Semester	
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Soil Physics (Agron. 2)	5	Soil Fertility (Agron. 3)	3
Bacteriology (Bot. 12)	5	Plant Physiology (Bot. 3)	4
Breeds of Livestock (An. Husb. 2)	4	Organic Evolution (Zool. 9)	3
Elective	2 or 3	Elective	6 or 7
	18 or 19		18 or 19

SENIOR YEAR

Farm Management (Agron. 6)	4	Soil Management (Agron. 8)	2
Prin. of Breeding (Agron. 7)	4	Adv. Grain Judging (Agron. 5)	2
Plane Surveying (C. E. 1a)	3	Common Diseases (Vet. Sci. 57)	4
Farm Records and Accounts (Agron. 10)	2	Plant Pathology (Bot. 4)	4
Elective	5 or 6	Farm Mechanics (Agron. 4)	3
		Elective	3 or 4
	18 or 19		18 or 19

COURSE IN ANIMAL INDUSTRY

JUNIOR YEAR

First Semester		Second Semester	
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Breeds of Livestock (An. Husb, 2)	4	Feeding Farm Animals (An. Husb. 4)	3
Bacteriology (Bot. 12)	5	Common Diseases of Farm Animals (Vet. Sci. 57)	4
Soil Physics (Agron. 2)	5	Organic Evolution (Zool 9)	3
Poultry Management (Poult. 41)	3	Optional	7
		Animal Husbandry.	
		Market Classes and Grades of Livestock (An. Husb. 5)	2
		Elective	4 or 5
		Poultry.	
		Poultry Breeds (Poult. 42)	3
		Incubation and Brooding (Poult. 43)	3
	19		18 or 19

SENIOR YEAR

First Semester		Second Semester	
Principles of Breeding (Agron. 7)	4	Farm Mechanics (Agron. 4)	3
Embryology (Zool. 8)	4	Optional	16
Farm Management (Agron. 6)	4	Animal Husbandry.	
Optional	7	Horse, Swine and Dairy Cattle Production (An. Husb. 8)	3
Animal Husbandry.		Breeding Farm Animals (An. Husb. 6)	2
Advanced Stock Judging (An. Husb. 3)	1	Obstetrics (Vet. Sci. 54)	2
Beef Cattle and Sheep Production (An. Husb. 7)	3	Elective	8 or 9
Elective	2 or 3	Poultry.	
Poultry.		Poultry Houses (Poult. 44)	3
Poultry Feeds and Feeding (Poult. 45)	2	Market Poultry (Poult. 46)	3
Elective	4 or 5	Adv. Poultry Breeds (Poult. 47)	3
		Elective	6 or 7
	18 or 19		18 or 19

COURSE IN DAIRY HUSBANDRY

JUNIOR YEAR

First Semester		Second Semester	
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Breeds of Livestock (An. Husb. (2)	4	Butter Making (Dairy 3)	4
Bacteriology (Bot. 12)	5	Dairy Technology (Dairy 10)	3
Testing Milk Products (Dairy 2)	2	Feeding Farm Animals (An. Husb. 4)	3
Milk Production (Dairy 7)	2	Elective	6 or 7
Elective	3 or 4		
	18 or 19		18 or 19

SENIOR YEAR

Soil Physics (Agron. 2)	5	Sociology (Econ. 4)	3
Farm Management (Agron. 6)	4	Obstetrics (Vet. Sci. 54)	2
Cheese Making (Dairy 4)	4	Dairy Practice (Dairy 6)	3
Market Milk (Dairy 5)	2	Dairy and Market Management (Dairy 8)	2
Seminar (Dairy 9)	1	Seminar (Dairy 9)	1
Elective	2 or 3	Elective	7 or 8
	18 or 19		18 or 19

COURSE IN HORTICULTURE

JUNIOR YEAR

First Semester		Second Semester	
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Soil Physics (Agron. 2)	5	Soil Fertility (Agron. 3)	3
Bacteriology (Bot. 12)	5	Plant Physiology (Bot. 3)	4
Systematic Pomology (Hort. 4)	3	Organic Evolution (Zool. 9)	3
Elective	3 or 4	Commercial Veg. Gardening (Hort. 11)	3
		Elective	3 or 4
	18 or 19		18 or 19

SENIOR YEAR

Commercial Fruit Growing (Hort. 7)	3	Landscape Gardening (Hort. 6)	3
Plane Surveying (C. E. 1a)	3	Greenhouse Const. and Mgmt. (Hort. 5)	3
Prin. of Breeding (Agron. 7)	4	Plant Pathology (Bot. 4)	4
Elective	8 or 9	Elective	8 or 9
	18 or 19		18 or 19

Departments of Instruction

AGRONOMY

Professor Atkinson, Assistant Professor Whitcomb, Assistant Professor Currier, Assistant Professor Murdock, Assistant Professor Gieseker.

The agronomy course is designed to afford special training in the production of field crops, the cultivation of soils, the maintenance of soil fertility, the management of farms, and the use of machinery and power for doing the work of the farm. The aim in this work is to fit men to intelligently deal with the many problems arising in the developement of western agriculture under dry land and irrigated conditions.

The facilities provided for agronomy instruction include suitably equipped crops and soil laboratories, the crops and materials of the college farm and experimental fields and of the State Grain Laboratory, farm management survey records of over one thousand farms in Montana which represent different systems of management and an equipment of engines, tillage, seeding and harvesting machinery especially provided for instructional purposes.

1. Field Crops. I; 4 cr. Prerequisite Botany 1. Fee $1. Mr Whitcomb.

History, characteristics, uses and methods of growing and handling wheat, oats, barley, corn, flax, and other cereals; commercial grading of grain and use of the grain score card. Lect. 2; lab. 2.

2. Soil Physics. I; 5 cr. Prerequisites Physics 1a, Geology 1, Chemistry 5. Fee $2. Mr. Whitcomb, Mr. Gieseker.

Soil and its cultivation in relation to growth of crops; origin and formation of soils; soil classification and influence of tillage methods on soil moisture, texture, temperature and aeration. Lect. 3; lab. 2.

3. Soil Fertility. II; 3 cr. Prerequisites Chemistry 7, Botany 12. Mr. Gieseker.

Maintenance of fertility; use and influence of fertilizers and crop rotations on the productive capacity of the soil. Lect. 3.

4. Farm Mechanics. II; 3 cr. Prerequisites Physics 1a, Agronomy, 1, 2. Mr. Murdock.

Development, construction, functions and methods of operating, adjusting and repairing implements and farm machinery. Lect. 2; lab. 1.

5. Advanced Grain Judging. II; 2 cr. Prerequisite Agronomy 1. Mr. Whitcomb.

Study of cereal, grass and forage seeds with practice judging. Lab. 2.

6. Farm Management. I; 4 cr. Prerequisites Agronomy 1, 2. Mr. Currier.

Relative profits of different systems of farm management; relation of the industry of agriculture to other industries.

7. Principles of Breeding. I; 4 cr. Prerequisite Zoology 9. Mr. Atkinson.

Variation, biometry, heredity, selection, reversion and prepotency as applied to plants and animals; methods used in improvement of plants. Lect. 4.

8 Soil Management. II; 2 cr. Prerequisites Agronomy 1, 2. Mr. Whitcomb.

Methods of handling alkali, gumbo, sandy, heavy clay, muck, peat and worn-out soils; soil problems of irrigated and dry farms. Lect. 2.

9. Thesis. Yr.; 4 cr. Mr. Atkinson.

Senior agronomy students may prepare a thesis on some subject approved by the head of the department not later than November 15.

10. Farm Records and Accounts. I; 2 cr. Mr. Currier.

Topics to be considered: labor records, labor distribution charts, feeding records, accounts with single enterprises.

11. Forage Crops. II; 4r. Prerequisite Agronomy 1. Fee $1. Mr. Whitcomb.

History, characteristics and methods of management of grasses, clovers and other crops where the entire plant is cut for hay or used for silage, pasturage or soiling. Lect. 3; lab. 1.

ANIMAL HUSBANDRY

Professor Arnett, Assistant Professor Riley, Mr. Dodderidge, Mr. Tretsven.

The course in animal husbandry covers the various phases of live stock production, such as, judging, selection, breeding, feeding, care and management for both farm and range condition.

The major portion of the first and second years of this course is devoted to the basic sciences as a preparation for the more practical work that is given during the third and fourth years.

The aim is to give the student a thorough training in practical and scientific live stock production. The work in judging begins with score card practice and leads to judging groups. Feeding is based upon scientific principles and made as practical as possible. Study of pedigree and breeding records give a knowledge of the most desirable families or strains within the different breeds and point the way to live stock improvement.

This course aims to give a scientific and practical training that fits the student for work in practical stock farming, agriculture college and experiment station work, instruction of animal husbandry in high schools, county expert, and extension lines.

The department of animal industry in the college maintains a number of the leading breeds of live stock for use in the class room. This equipment consists of several types of horses; Hereford, Shorthorn, Holstein, and Jersey cattle; Berkshire, Poland China, Duroc

Jersey and Yorkshire swine; Cotswold, Shropshire and Rambouillet sheep; and several of the leading breeds and types of poultry.

The experiment station also maintains a large number of high grade and pure bred animals for experimental work that are available for study and offer many practical demonstrations in feeding and management.

The equipment of barns, silos, etc., are of modern plan and construction and afford an excellent opportunity for study.

1. Animal Types. II; 3 cr. Fee $.50. Mr. Dodderidge.

Horses, cattle, sheep and hogs in their relation to production and work. Score card practice, and comparative judging. Lect. 1; lab. 2.

2. Breeds of Live Stock. I; 5 cr. Prerequisite Animal Industry 1. Mr. Arnett, Mr. Martin.

History, development, characteristics, and adaptability of horses, cattle, sheep and swine. Comparative judging. Lect. 4; lab. 1.

3. Advanced Stock Judging. I; 1 cr. Prerequisites Animal Industry 1, 2, 5. Mr. Arnett.

Continuation of courses 1, 2 and 5. Placing groups of the various classes of stock. Lab. 1.

4. Principles of Feeding. I; 3 cr. Prerequisites Chemistry 5, 7. Mr. Arnett.

Principles underlying profitable feeding of farm animals. The composition of plants, animals and various feed stuffs. Lect. 3.

5. Market Classes and Grades of Live Stock. II; 2 cr. Prerequisite Animal Industry 1. Mr. Arnett.

Continuation of Animal Industry 1. Largely comparative judging. Lab. 2.

6. Breeding Farm Animals. II; 2 cr. Prerequisites Animal Industry 2, Agronomy 7. Mr. Riley.

Principles and practices of stock breeding. Record associations and pedigrees. Lect. 2.

7. Beef Cattle and Sheep Production. I; 3 cr. Prerequisite Animal Industry 4. Mr. Dodderidge.

Production, feeding, care and management of pure bred and grade beef cattle and sheep. Lect. 3.

8. Horse, Swine and Dairy Cattle Production. I; 3 cr. Prerequisite Animal Industry 4. Mr. Arnett.

Production, feeding, care and management of pure bred and grade horses, swine and dairy cattle. Lect. 3.

9. Experimental Feeding. II; 2 cr. Prerequisites Animal Industry 7, 8. Mr. Arnett.

Methods, principles and results of experimental work in animal husbandry. Lect. 1, lab. 1.

10. Thesis. Yr.; 2 cr. Mr. Arnett.

Animal husbandry students may elect thesis work during the senior year.

DAIRY HUSBANDRY

Professor Martin.

The course in dairy husbandry embraces both the productive and the manufacturing features of the dairy industry. The first two years are given largely to a study of the general and the agricultural sciences with a view toward preparing the student for their economic application to practical dairy problems.

The productive phase of the work includes the management of the dairy herd, handling of milk on the farm, transportation, distribution, inspection and marketing of milk. The manufacturing phase deals with the more technical work in separation, testing and preparation of dairy products, factory management, exhibiting, judging and marketing.

This course is designed to fit the student for the rapidly growing demand for men trained in practical, modern dairy science. The positions open are financially attractive, and offer splendid opportunities for rapid advancement, especially as pertains to college experiment station and educational lines. Of no less importance is the commercial side as it pertains to milk production, farm, factory and corporation management; farm, factory, and municipal inspection; dairy manufacturers and marketing.

1. **Farm Dairying.** I; 3 cr. Fee $2.

Study of the dairy cow; dairy sire; management of the calf, building up the herd, feeding for milk production. Use of the Babcock test; operation of hand separators; ripening cream and making butter on the farm. Lect. 2; lab. 1.

Testing Milk Products. I; 2 cr. Prerequisites Dairy 1, Chemistry 2. Fee $2.

Composition of milk and its products in relation to manufacturing processes. Determining ingredients and tests for adulterate and preservatives. Lect. 1; lab. 1.

3. **Creamery Butter Making.** II; 4 cr. Prerequisites Dairy 1, 2.

Handling of cream and making butter on a commercial scale. Practice in pasteurizing; making of starters; ripening cream, churning, packing and storage of butter. Lect. 2; lab. 2.

4. **Cheese Making.** I; 4 cr.

Modern methods of making the common types of cheeses, as applied to factory and farm practice. Lect. 2; lab. 2.

5. **Market Milk.** I; 2 cr.

Production and control of the milk supply, pasteurizing, standardizing, certifying, modifying and city milk inspection. Lect. 2.

6. **Dairy Practice.** II; 3 cr. Prerequisites Dairy 3, 4.

Making butter, cheese and frozen dairy products, preparation of exhibits, scoring, marketing and keeping dairy accounts. Lect. 1; lab. 2.

7. Milk Production. I; 3 cr. Prerequisite Dairy 1.

Factors influencing secretion, composition and properties of milk; care and handling of milk on the farm and in transit; distribution and marketing. Lect. 2; lab. 1.

8. Dairy and Market Management. II; 2 cr.

Organization and management of dairy farms, herd improvement associations, organization, location, construction and equipping of creameries and cheese factories; cold storage and marketing of dairy products and creamery sidelines. Lect. 1; lab. 1.

9. Seminar. Yr.; 2 cr.

Current dairy problems and investigations by experiment stations and comparative studies of practical dairying in other countries.

10. Dairy Technology. II; 3 cr.

Composition, manufacture and utilization of dairy products and by-products as applied in domestic and commercial arts.

HORTICULTURE

Professor Whipple, Assistant Professor Starring.

The four years' course in horticulture, leading to the degree of Bachelor of Science in horticulture, is designed to prepare students as teachers in agricultural colleges, investigators in the agricultural experiment stations, editors of horticultural papers, managers of fruit associations and superintendents of commercial orchards and fruit plantations. The Western United States leads the world in methods of orcharding and disposing of orchard products, and there is a strong and growing demand for persons properly trained to manage the orchard project now operated throughout the fruit regions of the west. Fruit growing, when done in a scientific way, is extremely profitable and presents an inviting field for the trained horticulturist. The college offers good facilities for a thorough training in all branches of horticulture.

1. Principles of Plant Production. II; 3 cr. Prerequisite Botany 1. Fee $1.50. Mr. Whipple.

Propagation of plants by spores, seeds, cuttings, layers, graftage. Methods of gathering and storing seeds; transplanting. Lect. 2; lab. 1.

4. Systematic Pomology. I; 3 cr. Prerequisites Horticulture 1, Botany 1. Fee $5. Mr. Whipple.

Description and naming of varieties of fruit. Judging of exhibition fruit and discussion of score cards. Evolution of cultivated plants, especially fruits. Lect. 2; lab. 1.

5. Greenhouse Construction and Management. I; 3 cr. Prerequisites Horticulture 1, Agronomy 2, 3. Mr. Whipple.

Construction, heating and maintaining of greenhouses; growing plants in greenhouses and conservatories.

6. Landscape Gardening. II; 3 cr. Fee $1. Mr. Starring.

Laying out and planting of private and public grounds are discussed. Trees, shrubs, and flowers suited to Montana conditions are studied. Lect. 2; lab. 1.

7. Commercial Fruit Growing. I; 3 cr. Prerequisites Horticulture 1, 4, Agronomy 2, 3. Mr. Whipple.

Planting, cultivating, irrigating, and managing commercial orchards. Methods of picking, grading, packing, and marketing fruits. Lect. 2; lab. 1.

8. Thesis. Credits variable. Mr. Whipple.

Horticultural students may elect to prepare during the senior year a thesis, the subject of which must be approved by the head of the department of horticulture.

10. Fruit Growing and Gardening. I; 4 cr. Prerequisite Horticulture 1. Mr. Whipple, Mr. Starring.

Principles of orcharding and gardening, with special reference to their bearing upon home orcharding and home gardening. Lect. 4.

11. Commercial Vegetable Growing. II; 3 cr. Prerequisites Horticulture 1, 10, Agronomy 2. Mr. Starring.

Organization and management of market and truck gardens; special problems connected with growing vegetables on a large scale. Preparation of vegetables for market; methods of marketing, storage of vegetables. Lect. 2; lab. 1.

POULTRY HUSBANDRY

Professor Schoppe

41. Poultry Management. I; 3 cr.

Types and breeds of poultry, fancy and utility classification of fowls, principles of breeding, housing, feeding, incubation, and brooding, preparation for and marketing of poultry products. Lect. 3.

42. Poultry Breeds. II; 3 cr.

Origin and development of the more important breeds of poultry, breeding fancy poultry. Preparation of birds for show. Judging by score card and comparison. Lect. 2; lab. 1.

43. Incubation and Brooding. II; 3 cr.

Operating incubators, testing eggs, keeping records, operating brooders, care and feeding of chicks. Lect. 2; lab. 1.

44. Poultry Houses. II; 3 cr.

Planning, arranging, and designing poultry houses. Lect. 3.

45. Poultry Feeds and Feeding. I; 2 cr.

Feeds suited to poultry, grain mixture, etc., feeding for egg production and fattening stock for market. Lect. 2.

46. Marketing Poultry Products. II; 3 cr.

Preparation of poultry and eggs for market, storage preservation, principles of marketing, killing, picking, and packing poultry.

Drawing, boning, and trussing fowls for special market. Candling, grading, and packing eggs. Lect. 2; lab. 1.

47. Advanced Poultry Breeding. II; 3 cr. Prerequisites Agronomy 7, Poultry 42.

Breeding birds for show purposes; judging birds, selection and mating of birds for fancy and utility purposes. Lect. 2; lab. 1.

VETERINARY SCIENCE

Dr. Welch

51. Veterinary Physiology and Anatomy. II; 4 cr. Fee $2.

Physiology of domestic animals, dealing with digestion and assimilation of foods, the circulation and functions of the blood, the nervous system and organs of special sense, and muscles and phenomena of locomotion. Lect. 3; lab. 1.

53. Pathology. II; 3 cr. Prerequisite Veterinary Science 51.

Study of normal and pathological tissues. Gross and microscopical specimens will be used for demonstration. Lect. 1; lab. 2.

54. Obstetrics. II; 2 cr. Prerequisite Veterinary Science 51.

Diseases of domestic animals incident to reproduction. Normal parturition, dystokia, and care of the newborn; illustrated by clinic cases.

56. Sanitary Science. II; 2 cr. Prerequisite Veterinary Science 57.

Care and handling of farm animals affected with contagious and infectious diseases. Methods of diagnosis, treatment, quarantine and general preventitive measures.

57. Common Diseases of Animals. II; 4 cr.

Diagnosis and first aid treatment of the more common ailments of livestock. Farm sanitation and general measures for disease prevention. Illustrated by clinic cases.

College of Engineering

The rapid development of the State of Montana makes the profession of engineering one of great importance. The development of our natural resources will require the services of engineers with specialized training.

As a result of the action of the State Board of Education, made necessary by the passage of the Leighton Bill, all engineering courses supported by the state, except the course in mining engineering at the School of Mines at Butte, have been concentrated in the State College at Bozeman. As a result of this concentration of effort, important additions and improvements have been made, very important additional laboratory space has been provided and extensive and important additions have been made to the equipment largely without cost to the state.

COURSES AND DEGREES

The following engineering courses are offered in the College: Civil Engineering, Electrical Engineering, Mechanical Engineering, Chemical Engineering, Architectural Engineering, and Irrigation Engineering.

The degree of Bachelor of Science is conferred upon students completing the work prescribed in any one of the college courses and the name of the course taken is placed on the diploma.

A candidate for the advanced degree of Civil Engineer, of Electrical Engineer, of Mechanical Engineer, of Chemical Engineer, of Architectural Engineer, or of Irrigation Engineer, must hold a bachelor's degree from this college or another of at least equal rank, and in the line of work for which he applies for advanced degree, he shall have sufficient preparation in his major subject to enable him to carry on independent investigations. He shall complete a full year of resident study.

There shall be one major subject and one or two minor subjects. At least one-half of the work must be done in the major subject. The plan of the work must be approved by the Faculty Committee on Graduate Work by October 1. The candidate shall also present a thesis embodying the results of independent investigation, which may be a part of the credits required for the major subject. He shall also pass an oral examination on his graduate work before a committee of not less than five members representing the departments offering his major and minor subjects and two or more allied departments. Non-resident graduates in engineering must have at least three years of successful professional experience.

COURSE IN CIVIL ENGINEERING

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
Algebra (Math. 1)	3	Anal. Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Elem. Drawing (M. E. 1)	3	Land Surveying (C. E. 1)	2
Wood Work (M. E. 2)	2	Military Drill or Physical Education	1
Forge Work (M. E. 6)	1		
Military Drill or Physical Education	1		
	19		19

SOPHOMORE YEAR.

Expository Comp. (Eng. 2)	2	Calculus (Math. 4)	4
Calculus (Math. 4)	5	General Physics (Phys. 1)	3
General Physics (Phys. 1)	3	Physical Meas. (Phys. 2)	2
Physical Meas. (Phys. 2)	2	Tech. Mechanics (C. E. 5)	4
Plane Surveying (C. E. 2)	3	Geology (Geol. 1)	3
Minerology (Geol. 2) —or— Engr. Chemistry (Chem. 12)	3	R. R. Engineering (C. E. 4)	2
Military Drill or Physical Education	1	Military Drill or Physical Education	1
	19		19

JUNIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mech. of Materials (C. E. 6)	4	Hydraulics (I. E. 4)	3
Highway Engr. (C. E. 7)	2	Roofs and Bridges (C. E. 29)	3
Irrigation Eng. (I. E. 1)	3	Hydraulic Lab. (I. E. 6)	1
Str. of Mtrl. Lab. (C. E. 8)	1	Astronomy (Math. 6)	4
Graphics (C. E. 28)	2	Pbl. Water Supply (C. E. 15)	2
R. R. Economics (C. E. 9)	3	Hydraulic Eng. (I. E. 5)	3
Steam Eng. (M. E. 7)	2	Mech. Laboratory (M. E. 15a)	1
	19		19

SENIOR YEAR

Economics (Econ. 5)	3	Sanitary Eng. (C. E. 14)	3
Bridge Design (C. E. 30)	4	Bridges and Dams (C. E. 31)	2
Municipal Eng. (C. E. 3)	2	Concrete Const. (C. E. 32)	3
Found. and Masonry (C. E. 21)	3	Cem and Concr. Lab. (C. E. 34)	1
Geodesy (C. E. 17)	2	Contract and Spec. (C. E. 23)	1
San. Bacteriology (Biol. 12)	2	Stl. Mill Bldgs (A. E. 11)	2
Elect. Machinery (E. E. 1)	2	Seminar (C. E. 12)	1
Elect. Laboratory (E. E. 14a)	1	Thesis (C. E. 27)	4
		Elective	2
	19		19

COURSE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
Algebra (Math. 1)	3	Anal. Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Elem. Drawing (M. E. 1)	3	Forge Work (M. E. 9)	2
Wood Work (M. E. 2)	2	Military Drill or Physical Education	1
Forge Work (M. E. 6)	1		
Military Drill or Physical Education	1		
	19		19

SOPHOMORE YEAR.

Expository Comp. (Eng. 2)	2	Calculus (Math. 4)	4
Calculus (Math. 4)	5	General Physics (Phys. 1)	3
General Physics (Phys. 1)	3	Physical Meas. (Phys. 2)	2
Physical Meas. (Phys. 2)	2	Mechanics (C. E. 5)	4
Elect. Machinery (E. E. 1)	2	Elect. Diagram (E. E. 7)	4
Pattern Work (M. E. 2a)	1	Military Drill or Physical Education	1
Foundry (M. E. 4)	1		
P. P. Practice (M. E. 16)	1		
Military Drill or Physical Education	1		
	18		18

JUNIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mechanics (C. E. 5)	4	Applied Elect. (E. E. 5)	4
Dynamos and Motors (E. E.3)	3	Heat Power (M. E. 18a)	2
Electricity and Mag. (Phys. 5)	4	Dynamo Design (E. E. 8)	3
Steam Engr. (M. E. 7)	2	Electrical Lab. (E. E. 6)	2
Strength of Mtrls. (C. E. 8)	1	Mechanical Lab. (M. E. 15a)	2
Electrical Lab. (E. E. 4)	2	Seminar (E. E. 17)	1
Seminar (E. E. 17)	1	Electives	2 or 3
	19		18 or 19

SENIOR YEAR

Economics (Econ. 5)	3	Alter. Currents (E. E. 11)	4
Alter. Currents (E. E. 9)	4	Electrical Design (E. E. 16)	3
Electrical Design (E. E. 13)	3	Contracts and Spec. (C. E. 23)	1
Electrical Lab. (E. E. 10)	3	Electrical Lab. (E. E. 12)	2
Seminar E. E. 17)	1	Seminar (E. E. 17)	1
Thesis (E. E. 20)	2	Thesis (E. E. 20)	3
Elective	2 or 3	Elective	3 or 4
	18 or 19		17 or 18

COURSE IN MECHANICAL ENGINEERING

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
Algebra (Math. 1)	3	Anal. Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Elem. Drawing (M. E. 1)	3	Forge Work (M. E. 9)	2
Forge Work (M. E. 6)	1	Military Drill or Physical Education	1
Wood Work (M. E. 2)	2		
Military Drill or Physical Education	1		
	19		19

SOPHOMORE YEAR.

Expository Comp. (Eng. 2)	2	Calculus (Math. 4)	4
Calculus (Math. 4)	5	General Physics (Phys. 1)	3
General Physics (Phys. 1)	3	Physical Meas. (Phys. 2)	2
Physical Meas. (Phys. 2)	2	Mechanics (C. E. 5)	4
Mechanism (M. E. 5)	4	Mechanism (M. E. 8)	3
Pattern Work (M. E. 2a)	1	Machine Work (M. E. 17)	2
Foundry (M. E. 4)	1	Military Drill or Physical Education	1
Military Drill or Physical Education	1		
	19		19

JUNIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mechanics (C. E. 6)	4	Machine Design (M. E. 13)	5
Steam Engr. (M. E. 7)	2	Thermodynamics (M. E. 18)	4
Elect. and Mag. (Phys. 5)	4	Mechanical Lab. (M. E. 15a)	2
Valve Gears (M. E. 10)	3	Hydraulics (I. E. 4)	3
Pr. Plant Practice (M. E. 16)	1	Machine Work (M. E. 27)	2
Str. of Materials (C. E. 8)	1		
Machine Work (M. E. 21)	2		
	19		18

SENIOR YEAR

Economics (Econ. 5)	3	Industrial Engr. (M. E. 25)	2
Gas Power (M. E. 22)	3	Steam Engineering (M. E. 26)	3
Machine Design (M. E. 23)	5	Plant Design (M. E. 29)	2
Power Laboratory (M. E. 20)	2	Engineering Lab. (M. E. 28)	2
Electric Power (E. E. 14)	3	Heat. and Vent. (M. E. 24)	3
Electrical Lab. (E. E. 14a)	2	Contracts (C. E. 23)	1
Seminar (M .E. 11)	1	Seminar (M. E. 11)	1
		Thesis (M. E. 30)	4
	19		18

COURSE IN ARCHITECTURAL ENGINEERING

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
Algebra Math. 1)	3	Anal. Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Elementary Drawing (M. E. 1)	3	Freehand Drawing (Art 3)	2
Wood Work (M. E. 2)	2	Military Drill or Physical Education	1
Forge Work (M. E. 6)	1		
Military Drill or Physical Education	1		
	19		19

SOPHOMORE YEAR.

Expository Comp. (Eng. 2)	2	Calculus (Math. 4)	4
Calculus (Math. 4)	5	Theoretical Mechanics (C. E. 5)	4
General Physics (Phys. 1)	3	General Physics (Phys. 1)	3
Physical Meas. (Phys. 2)	2	Physical Meas. (Phys. 2)	2
Freehand Drawing (Art 3a)	2	Freehand Drawing (Art 3a)	2
Working Drawings (A. E. 1)	3	Elementary Design (A. E. 4)	2
Building Sanitation (A. E. 5)	1	Military Drill or Physical Education	1
Military Drill or Physical Education	1		
	19		18

JUNIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mechanics of Matrls. (C. E. 6)	4	Hydraulics (I. E. 4)	3
Graphics (C. E. 28)	2	Roofs and Bridges (C. E. 29)	3
Strength of Matl. Lab. (C. E. 8)	1	Hydraulics (I. E. 6)	1
Steam Engr. (M. E. 7)	2	Specifications and Working Drawings (A. E. 7)	3
Hist. of Architecture (A. E. 3)	3	Hist. of Architecture (A. E. 3)	3
Specifications and Working Drawings (A. E. 6)	3	Estimating (A. E. 8)	2
Elective	2	Elective	2
	19		19

SENIOR YEAR

Economics (Econ. 5)	3	Heat and Ventilation (M E. 24)	3
Bridge Design (C. E. 30)	4	Bridges and Dams (C. E. 31)	2
Found. and Masonry (C. E. 21)	3	Concrete Constr. (C. E. 32)	3
Electrical Power (E. E. 14))	3	Steel Mill Building (A. E. 11)	2
Arch. Decoration (A. E. 10)	2	Cont. and Spec. (C. E. 23)	1
Electrical Lab. (E. E. 14a)	2	Illumination (E. E. 19)	2
Elective	2	Cem. and Con. Lab. (C. E. 34)	1
		Thesis (A. E. 12)	5
	19		19

COURSE IN CHEMICAL ENGINEERING

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
Algebra (Math. 1)	3	Anal. Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Elem. Drawing (M. E. 1)	3	Forge Work (M. E. 9)	2
Wood Work (M. E. 2)	2	Military Drill or Physical Education	1
Forge Work (M. E. 6)	1		
Military Drill or Physical Education	1		
	19		19

SOPHOMORE YEAR.

Calculus (Math. 4)	5	Calculus (Math. 4)	4
General Physics (Phys. 1)	3	General Physics (Phys. 1)	3
Physical Meas. (Phys. 2)	2	Physical Meas. (Phys. 2)	2
Quantitative Anal. (Chem. 3)	4	Quantitative Anal. (Chem. 3)	4
Mechanism (M. E. 5)	4	Mechanics (C. E. 5)	4
Military Drill or Physical Education	1	Pr. Plant Practice (M. E. 16)	1
		Military Drill or Physical Education	1
	19		19

JUNIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mech. of Materials (C. E. 6)	4	Sound and Light (Phys. 3 and 4)	4
Organic Chemistry (Chem. 5)	4	Adv. Organic Chem. (Chem. 9)	4
Mineralogy (Geol. 2)	3	Thermodynamics (M. E. 18)	4
Elect. and Mag. (Phys. 5)	4	Mechanical Lab. (M. E. 15a)	2
Steam Engr. (M. E. 7)	2	Fuel Analysis (Chem. 17)	3
	19		19

SENIOR YEAR

Economics (Econ. 5)	3	Cont. and Spec. (C. E. 23)	1
Electric Power (E. E. 14)	3	Ind. Chemistry (Chem. 14)	5
Ind. Chemistry (Chem. 14)	5	Seminar (Chem. 20)	1
Phys. Chemistry (Chem. 19)	4	Thesis (Chem. 21)	3
Str. of Matrl. Lab. (C. E. 8)	1	Elective	7 or 9
Seminar (Chem. 20)	1		
Thesis (Chem. 21)	1		
	18		17 or 19

COURSE IN IRRIGATION ENGINEERING

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
Algebra (Math. 1)	3	Anal. Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Elem. Drawing (M. E. 1)	3	Land Surveying (C. E. 1)	2
Wood Work (M. E. 2)	2	Military Drill or Physical Education	1
Forge Work (M. E. 6)	1		
Military Drill or Physical Education	1		
	19		19

SOPHOMORE YEAR.

Calculus (Math. 4)	5	Calculus (Math. 4)	4
General Physics (Phys. 1)	3	General Physics (Phys. 1)	3
Physical Meas. (Phys. 2)	2	Physical Meas. (Phys. 2)	2
General Botany (Bot. 1)	5	Geology (Geol. 1)	3
Plane Surveying (C. E. 2)	3	Mechanics (C. E. 5)	4
Military Drill or Physical Education	1	Elective	2
		Military Drill or Physical Education	1
	19		19

JUNIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mech. of Materials (C. E. 6)	4	Irrigation Engr. (I. E. 2)	3
Graphics (C. E. 28)	2	Hydraulics (I. E. 4)	3
Irrigation Engr. (I. E. 1)	3	Hydraulic Lab. (I. E. 6)	1
Field Crops (Agron. 1)	4	Forage Crops (Agron. 11)	4
Str. of Matrl. Lab. (C. E. 8)	1	Canal Surveying (I. E. 10)	3
Found. and Masonry (C. E. 21)	3	Elective	3
	19		19

SENIOR YEAR

Economics (Econ. 5)	3	Hydraulic Engr. (I. E. 5)	3
Electric Power (E. E. 14)	3	Canal Management (I. E. 3)	3
Steam Engr. (M. E. 7)	2	Contracts and Spec (C. E. 23)	1
Soil Physics (Agron. 2)	5	Mechanical Lab. (M. E. 15a)	2
Farm Management (Agron. 6)	4	Seminar (I. E. 8)	1
Electrical Lab. (E. E. 14a)	2	Thesis (I. E. 9)	3
		Elective	6
	19		19

Departments of Instruction

CIVIL ENGINEERING

Professor Conkling, Professor Plew, Assistant Professor Snow

The civil engineering course is designed to give a broad education in the general and scientific subjects which are the foundation of all branches of technology, and special training in those subjects comprised under the term "Civil Engineering." The young men are taught how to think, and how to attack new problems; they are taught the underlying principles of engineering and inspired with a desire to do their best work. The graduate is prepared to enter upon the location and construction of railroads, public highways, bridges, water works, water power development, irrigation, sewerage systems, and sewage disposal, city and municipal engineering. He can with advantage take up allied work in mining, mechanical, electrical, or architectural engineering.

The freshman year is devoted to fundamental studies which give both general culture and preparation for the technical work of the following years.

In the sophomore year the fundamental subjects of mathematics, English, physics, and chemistry are completed, and the technical subjects of civil engineering are begun. The theory of land surveying is taught by lectures, field work, and drawing room exercises. The study of the theory and principles of highway and railroad engineering is begun.

The junior year completes the work in theoretical and applied mechanics and railroad engineering. The technical subjects of hydraulic engineering, structures and bridges, theory and design, are begun. The course in economics begun in the first term of the junior year is continued for three semesters, and consists of the study of such subjects as land, capital, labor, coinage, banking, interest, wages, taxation, etc. The important economic questions of the present time are considered and discussed.

The senior year is devoted to municipal and sanitary engineering, plain and reinforced concrete construction, the design of typical bridges and buildings, with complete working drawing, bill of materials and estimate of cost.

1. Land Surveying. II; 2 cr. Prerequisite Mathematics 2. Fee $1.50. Mr. Snow.

Theory, adjustment and use of instruments in land surveying, hydrography, water measurement, irrigation and draining, plotting and mapping. Lab. 2.

1a. Surveying. I; 3 cr. Prerequisite Mathematics 2. Fee $1.50 Mr. Snow.

Theory, adjustment, and use of instruments in land surveying, hydrography, water measurement, irrigation and draining, plotting and mapping, draughting, and office work. Lect. 2; lab. 2.

2. **Plane Surveying.** I; 3 cr. Prerequisites Mathematics 2, Civil Engineering 1. Fee $1.50. Mr. Snow.

Computation of areas, dividing of land, the methods of field, hydrographic, mine, and city surveying, barometric and spirit leveling, computation of earth work; map drawing and topographic signs; field work with transit level, and plane table; map drawing from students' field notes. Lab. 3.

3. **Municipal Engineering.** I; 2 cr. Prerequisite Civil Engineering ?. Mr. Snow.

City planning, allotting and platting additions; construction of streets, sidewalks, curbs, gutters, and parkings; disposal of refuse; city parks and their paths, walks, and roadways; law affecting the work of the city engineer. Lect. 2.

4. **Railroad Engineering.** II; 2 cr. Prerequisite Civil Engineering 2. Fee $1.50. Mr. Snow.

Railroad reconnoisance, preliminary and location surveys. Railroad structures, simple and compound curves, easement curves and transition spirals, simple and compensated grades, switches, turnouts and crossings.

4a. **Summer School in Railroad Engineering.** 2 cr. Mr. Snow.

Required of all frehmen civil engineering students at the end of the second semester. Freshmen act as rodmen, chainmen, axemen, etc.

4b. **Summer School in Railroad Surveying.** 2 cr. Mr. Snow.

Required of all sophomore civil engineering students at the end of the second semester. A camp is established and regular field work is carried on for two weeks.

5. **Theoretical Mechanics.** II; 4 cr. Prerequisite Mathematics 4. Mr. Snow.

Forces and force systems, center of gravity and centroids, stress, principles of equilibrium, rectilinear and curvilinear motion, work and energy, impulse, momentum and vectors. Lect. 4.

6. **Mechanics of Materials.** I; 4 cr. Prerequisites Mathematics 4, Civil Engineering 5. Mr. Conkling.

Elasticity and strength of timber, brick, stone and metals. Theory of beams, columns and shafts. Lect. 4.

7. **Highway Engineering.** I; 2 cr. Mr. Conkling.

Highway materials; tests; traffic data; methods of drainage, including types of culverts and area of water way. Federal, state, and county aid. Highway laws. Traction, sanitation, radiation of light and heat, slipperiness, ease of cleaning, repairing, etc. Lect. 2.

8. **Strength of Materials Laboratory.** I; 1 cr. Prerequisite Civil Engineering 6. Fee $2. Mr. Conkling.

Experimental determinations of the strength and the several moduli of the more important of the materials of engineering. Lab. 1.

9. Railroad Economics. I; 3 cr. Prerequisite Civil Engineering 4. Fee $1.50. Mr. Snow.

Making of profiles, field maps, cross-sections, etc., from students' notes of field work. Economics of railroad location; arrangement of yards, terminals and stations. Making location map. Construction of the roadbed. Maintenance of way and the elements of railroad operation. Lect. 1, drawing 2.

12. Seminar. II; 1 cr. Mr. Conkling, Mr. Snow.

Members of the senior class meet to discuss the articles that appear in certain assigned engineering periodicals. Lect. 1.

14. Sanitary Engineering. II; 3 cr. Prerequisites Civil Engineering 1, 3, 15. Fee $1.50. Mr. Snow.

Methods of sewage treatment and disposal. The design of a sewerage system and a disposal plant; house drainage; specifications and estimate of cost. Lect. 2, drawing 1.

15. Public Water Supplies. II; 2 cr. Prerequisites Irrigation Engineering 4, 5. Fee $1.50. Mr. Conkling.

Systems of water supply, including reservoirs, pipe lines, pumping plants; the design of a water supply purification and distribution system; specifications and estimate of cost. Lect. 2.

17. Geodesy. I; 2 cr. Prerequisites Mathematics 6, Civil Engineering 1, 2, 4. Mr. Snow.

Base line measurements, triangulation, balancing surveys and distributing errors, application of the method of least squares, principles of map projection. Determination of azimuth, latitude and longitude, the true north by sun and star observations.

21. Foundations and Masonry. I; 3 cr. Prerequisites Civil Engineering 6, 28. Fee $1.50. Mr. Plew.

Materials and methods employed in the construction of piers, abutments, masonry dams, retaining walls and foundations; economy of construction; strength of joined materials, specifications and costs. Lect. 2, drawing 1.

23. Contracts and Specifications. II; 1 cr. Mr. Conkling.

Correct form of specifications and judicial interpretation placed on technical terms commonly used in engineering specifications. Elective to all engineering students after the sophomore year. Lect. 1.

27. Thesis. II; 4 cr. Mr. Conkling.

The student will be required, before graduation, to present a suitable thesis upon some engineering subject in the line of his course. Subject must be chosen at the beginning of the senior year.

28. Graphic Statics. I; 2 cr. Prerequisites Physics 1, 2, Civil Engineering 5. Fee $1.50. Mr. Plew.

Stresses in roof trusses by the force polygon. Application of equi-

librium polygon to beams and girders. Stresses in bridge trusses, retaining walls and masonry arches. Lab. 2.

29. **Roofs and Bridges.** II; 3 cr. Prerequisites Civil Engineering 6, 28. Fee $1.50. Mr. Plew.

Theory and computation of stress in roof and bridge trusses under dead, live, and wind loads. Locomotive wheel loads on plate girders and bridge trusses. Lect. 2, drawing 1.

30. **Bridge Design.** I; 4 cr. Prerequisites Civil Engineering 6, 29. Fee $1.50. Mr. Plew.

Design of girders and trusses; computations and complete drawings for a through plate girder railroad bridge, and for a highway truss bridge. Specifications, bill of materials and estimate of cost. Lect. 1, drawing 3.

31. **Bridges and Dams.** II; 2 cr. Prerequisite Civil Engineering 30. Fee $1.50. Mr. Plew.

Higher structures, including continuous draw, cantilever, and suspension bridges; theory and design of masonry walls, and dams other than the gravity section. Lect. 2.

32. **Concrete Construction.** II; 3 cr. Prerequisites Civil Engineering 6, 30. Mr. Plew.

34. **Cement and Concrete Laboratory.** II; 1 cr. Prerequisites Civil Engineering 6, 30, 32. Fee $2. Mr. Conkling.

Given with Civil Engineering 32. Each student makes standard tests in the cement laboratory. Distribution of stress in reinforced concrete beams, and the manner of failure under breaking load. Lab. 1.

Manufacture, and properties of hydraulic cement, proportioning and mixing of concrete, reinforced concrete, reinforced concrete buildings, arches and other structures. Specifications and costs. Lect. 2, drawing 1.

ELECTRICAL ENGINEERING

Professor Thaler, Instructor Haines.

The course in electrical engineering is designed to give a thorough technical training in which theoretical subjects and the application of theory to the solution of practical problems are emphasized.

The general training consists of courses in English, mathematics, physics, chemistry, drawing and shop work. The technical work covers the theory and application of electrical phenomena, and the designing and testing of electrical machines and apparatus.

The equipment of the electrical laboratory is very complete, with apparatus of modern type, as well as machines of historical value. The laboratories contain various types of direct and alternating cur-

rent dynamos and motors, storage batteries, an oscillograph, a 150,000 volt transformer, a wireless station, and other equipment.

1. Electrical Machinery. I; 2 cr. Mr. Thaler.

Construction, care and operation of commercial electrical machines and apparatus, including batteries, electric lights, dynamos, motors, alternators, transformers and electrical measuring instruments. Lect. 2.

3. Dynamos and Motors. I; 3 cr. Prerequisites Physics 1, Mathematics 4. Mr. Haines.

Principles of electro-magnetism, theory of dynamo electric machines, design, construction and regulation of direct current dynamos and motors. Lect. 3.

4 Electrical Laboratory. I; 2 cr. Prerequisites Physics 2, 6. Fee $3.50. Mr. Haines.

Determination of armature and field resistance, magnetic leakage coefficients, characteristic curves and the efficiency and regulation of various types of direct current machines. Lab. 2.

5. Applied Electricity. II; 4 cr. Mr. Haines.

Methods and calculations of wiring, theory of primary cells and storage batteries, and electric light. Lect. 4.

6. Electrical Laboratory. II; 2 cr. Prerequisite Physics 2. Fee $3.50. Mr. Haines.

Tracing circuits and wiring, calibrating instruments, efficiency tests of storage batteries, and the candle power of incandescent lamps. Lab. 2.

7. Electrical Diagrams. II; 4 cr. Mr. Haines.

Conventional methods of representing electrical wiring and appliances. Diagrams of D. C. switchboards and of electric light wiring. General and detail drawings of dynamos. National Electrical Code and dynamo construction. Lect. 1, lab. 3.

8. Dynamo Design. II; 3 cr. Prerequisite Electrical Engineering 7. Mr. Haines.

Designing electro-magnets, dynamos and motors. Complete working drawings and specifications to accompany each design. Lab. 3.

9. Alternating Currents. I; 4 cr. Prerequistie Physics 5. Mr. Thaler.

Theory of alternating currents, properties of alternating current circuits, principles of alternators, transformers, rotary converters and induction motors. Lect. 4.

10. Electrical Laboratory. I; 3cr. Prerequisites Physics 6. Fee $3.50. Mr. Thaler.

Tests of single phase alternating current generators, motors and transformers, calibration of alternating current measuring instruments and meters. Lab. 3.

11. Alternating Currents. II; 4 cr. Prerequisite Electrical Engineering 9. Mr. Thaler.

Development of the symbolic method of Steinmetz, the solution of problems in transformer design and calculation of transmission line by the use of the algebra complex number and by vector diagrams.

12. Electrical Laboratory. II; 2 cr. Prerequisite Electrical Engineering 10. Fee $3.50. Mr. Thaler.

Tests of polyphase alternating current apparatus, including generators, motors, transformers and converters. Efficiency and regulation tests of a mercury arc rectifier, connecting transformers for transforming from three phase to two phase. Lab. 2.

13. Electrical Design. I; 3 cr. Mr. Haines.

Drawing and design of alternating current apparatus, circuits, and power plants. Open to students taking Electrical Engineering 9, 11. Lab. 3.

14. Electric Power. I; 3 cr. Mr. Haines.

Theory and construction of direct and alternating current generators, motors, transformers, and storage batteries; principles of power transmission and distribution. Lect. 3.

14a. Electrical Laboratory. I; 2 cr. Mr. Haines.

Efficiency and regulation tests of batteries and direct and alternating current generators and motors; efficiency and polarity tests of transformers. Lab. 2.

15. Wireless Telegraphy. I; 3 cr. Prerequisite Physics 5. Mr. Thaler.

Theory and development of wireless telegraphy; commercial apparatus and instruments for sending and receiving station. Lect. 2, lab. 1.

16. Electrical Design. II; 3 cr. Prerequisite Electrical Engineering 9. Mr. Thaler.

Design and drawing of a transformer or induction motor to conform with certain specifications for efficiency, including the calculations of the weight and cost of material. Lab. 3.

17. Seminar. Yr. 2 cr. Mr. Thaler.

Weekly meeting for the purpose of discussing current electrical engineering literature. Lect. 1.

18. Special Design. Credits variable. Mr. Thaler.

Design and construction of some special electrical apparatus or machine. Elective for seniors. Lab. 3.

19. Illumination. II; 2 cr. Mr. Thaler.

Sources of light, laws of photometry and measurement of light, calculation of illumination, electric light wiring, Underwriters' rules and symbols of the National Contractors' association. Lect. 2.

20. Thesis. Yr. 5 cr. Mr. Thaler.

Before graduating each student must present a suitable thesis upon some engineering subject in line with his course. The subject for the thesis must be chosen at the beginning of the senior year.

MECHANICAL ENGINEERING

Dean Richter, Professor Dearborn, Assistant Professor Challender, Instructor Miller, Instructor Kately, Mr. Park, Mr. Homann.

The puurpose of the course in mechanical engineering is to fit its graduates for successfully filling responsible positions as supervising and designing engineers. It furnishes fundamental training in the science, the art and the business of engineering, and prepares for the design, operation, superintendence and management of power plants, heating plants, refrigerating plants, lighting plants, pumping plants, and of the mechanical equipment of mines and railroads; and for the design, manufacture, installation ,testing and operation of shop and laboratory machinery, steam and gas engines, and auxiliary equipment.

The course comprises four years' instruction and training by text book, lecture, laboratory and shop practice, based on mathematics, physics, chemistry, mechanics, machine design, structural design and thermodynamics. It is designed to give the student a thorough knowledge of the basic principles of his profession and such technical skill as the application of theoretical principles in every day practice in shop and laboratory will insure. The work of each department—class room, laboratory, shop and designing room—is made to supplement the work of each of the others, so that the graduate beginning his profession has not only a valuable fund of scientific knowledge, but a first-hand acquaintance with sound practice, developed under the supervision of trained men—a balance in his technical equipment attainable in no better way.

1. **Mechanical Drawing.** I; 3 cr. Mr. Snow, Mr. Haines.

Use of drawing instruments and plain lettering; problems in geometric construction to teach accuracy in the use of instruments; orthographic projection. dimensions, arrangement, titles; tracing and blueprinting. Lab. 3.

2. **Woodwork.** I; 2 cr. Fee $2.50. Mr. Challender.

Use and care of carpenters' tools and practice in working to dimensions from blue-prints, building construction, roof framing and mill work. Lab. 2.

2a. **Pattern Work.** I; 1 cr. Prerequisite Mechanical Engineering 2. Fee $1.00. Mr. Challender.

Wood turning; construction of wood patterns for use in the foundry. Lab. 1.

3. **Descriptive Geometry.** II; 4 cr. Mr. Snow, Mr. Haines.

Projections of lines, plane surfaces and solids; intersections, tangents to curves and surfaces; problems in warped surfaces, practical applications. Lect. 1; lab. 3.

4. **Foundry.** I; 1 cr. Fee $1.50. Mr. Kately.

Floor and bench molding, core making, and in pouring castings of iron, brass and other alloys. Lab. 1.

5. Mechanism. I; 4 cr. Mr. Challender.

Relative motions of machine parts, including rolling cylinders and cones, lobed wheels, belts, levers, cams, linkwork, parallel and straight line motions, as applied in engine indicators, indicator reducing motions and motor car steering mechanisms. Lect. 2; lab. 2.

6. Forge Work. I; 1 cr. Fee $2. Mr. Kately.

Iron forging, forge fire; operations of drawing, upsetting and forming with simple welding. Lab. 1.

7. Steam Engineering. I; 2 cr. Prerequisites Chemistry 1, Physics 1, 2. Mr. Richter.

Steam boilers, their classification and construction, combustion and furnace efficiency, the principles underlying the economical transfer of heat from the furnace to the water. Scale, corrosion and feed water treatment. Lect. 2.

8. Mechanism. II; 3 cr. Mr. Challender.

Gearing; the cycloidal and involute systems, spur, bevel, helical and worm gears. Change gears, gearing in train, epicyclic trains with special application to automatic feeds and differential transmission for tractors. Lect. 1; lab. 2.

9. Forge Work. II; 2 cr. Fee $2.50. Mr. Kately.

Welding iron, steel and tool steel; power forging, forging, hardening, and tempering high-carbon and alloy-steel tools. Lab. 2.

10. Valve Gears. I; 3 cr. Prerequisite Mechanical Engineering 5. Mr. Dearborn.

Analytic and graphic study of engine valve mechanisms; use of the Zeuner, Bilgram and other diagrams in the design of valve gear. Reversing gear, Stephenson and Walshaert Gear as applied to locomotives and tractors, drop cut-off and non-releasing gears. Lect. 1, lab. 2.

11. Seminar. Yr. 2 cr. Mr. Dearborn.

Weekly meetings for the presentation and discussion of papers upon assigned topics pertaining to mechanical engineering. Lect. 1.

13. Machine Design. II; 5 cr. Prerequisites Mechanical Engineering 10, 6. Mr. Dearborn.

Materials, form and strength of parts, and methods of construction. Development of rational and empirical formulae, construction and interpretation of graphical charts, and graphical solution of problems. Working drawings of an assigned machine. Lect. 3; lab. 2.

15a. Mechanical Laboratory. II; 2 cr. Prerequisites Physics 1 Mechanical Engineering 7, 16. Fee $2. Mr. Dearborn.

Calibration and adjustment of laboratory instruments, with their use in determining the efficiency of hoists, screws, belt drives and the brake and indicated horse-power of steam and gasoline engines. Determination of clearance in engines; valve setting by measurement and by card. Lab. 2.

16. Power Plant Practice. Yr. 2 cr. Mr. Park.

Handling of boilers, pumps, engines, heating apparatus and electrical machinery. Lab. 1.

17. Machine Work. II; 2 cr. Prerequisites Mechanical Engineering 4, 9. Fee $2. Mr. Homann.

Chipping, filing, laying out, fitting, soldering and brazing; foundry practice. Lab. 2.

18. Thermodynamics. II; 4 cr. Prerequisites Mechanical Engineering 7, 16. Mr. Richter.

Gases, saturated and superheated vapors, and mixtures, cycle processes, flow of fluids through nozzles, and throttling processes, from the physical analytical and graphical standpoint. Lect. 4.

18a. Heat Power. II; 2 cr. Prerequisites Mechanical Engineering 7, 16. Mr. Richter.

Elementary course in thermodynamics for electrical engineering students. Lect. 2.

20. Power Laboratory. I; 2 cr. Prerequisite Mechanical Engineering 18. Fee $5. Mr. Dearborn.

Indicator practice, fuel comsumption tests of gasoline and oil engines. Calorimetric determination of the quality of steam. Tests of injectors, pumps, and engines. Lab. 2.

21. Machine Work. I; 2 cr. Prerequisite Mechanical Engineering 17. Fee $2. Mr. Homann.

Drilling, boring, turning, thread and gear cutting. Lab. 2.

22. Power Engineering. I; 3 cr. Mr. Dearborn.

Performance and design of gas motors, gas producers and other gas machinery, and air machinery from the thermodynamic standpoint. Lect. 3.

23. Machine Design. I; 5 cr. Mr. Dearborn.

Design of reciprocating parts, fly wheels and governors of engines. Balancing, stresses in turbine discs, and critical velocity of shafts. Working drawing. Lect. 3; lab. 2.

24. Heating and Ventilation. II; 3 cr. Prerequisite Mechanical Engineering 7. Mr. Dearborn.

Heating buildings by the various systems; ventilation with calculations for specific installations, specifications, and estimate of costs. Lect. 2; lab. 1.

25. Industrial Engineering. II; 2 cr. Mr. Richter.

Organization and management of industrial establishments, cost accounting, distribution of expenses, depreciation and amortization; systems of compensating labor. Lect. 2.

26. Steam Engineering. II; 3 cr. Mr. Dearborn.

Performance and design of steam motors and refrigerating machines. Lect. 3.

27. **Machine Tool Work.** II; 2 cr. Fee $2. Mr. Homann.

Work on lathe, milling machine and grinder; manufacture of reamers, drills, taps, mills, and dies; heat treatment of high speed steel. Lab. 2.

28. **Engineering Laboratory.** II; 2 cr. Fee $5. Mr. Dearborn.

Efficiency tests of heating, ventilating, compressed air, refrigerating and power plant equipment, steam and gas power plants and machinery. Lab. 2.

29. **Plant Design.** II; 2 cr. Mr. Dearborn.

Design of a plant for a specific purpose—i. e., heating, plumbing lighting, refrigerating, compressed air or shop plant. Lab. 2.

30. **Thesis.** II; 4 cr. Mr. Dearborn.

Before graduating, the student is required to present an acceptable thesis involving an investigation of some problem related to mechanical engineering. Work will be done under the supervision of the head of the department, but the student will devise his own methods.

32. **Automobile Practice.** Yr. 2 cr. Fee $3. Mr. Homann.

Engines, carburetors, ignition and lighting systems, oiling systems transmissions, differentials, clutches, steering gear, brakes and tires Elective for junior and senior college students, and sophomore engineering students. Number in class will be limited. Lab. 2 with lect

33. **Tractor Power.** II; 2 cr. Fee $1. Mr. Homann.

Steam, gasoline and oil tractors. Elective for college students Lab. 2.

ARCHITECTURAL ENGINEERING

Professor Plew.

The rapid increase of population in the State of Montana wi result in a healthy growth of our cities and towns. Homes, factories office buildings and public buildings will be erected.

In addition to the sciences which are common to all engineering courses, this course includes a thorough study of free hand drawing and the drawing of architectural designs. Ancient and modern architecture is studied in all its phases in order that the student ma become acquainted with proper architectural forms. The constructio of steel and concerte buildings, the sanitation of buildings, the interio and exterior decoration, and illumination, form an important part the instruction given in this course. The graduates are consequent well prepared to enter the profession of architectural engineering.

1. **Working Drawings.** I; 3 cr.

Detailing on a large scale, floors, windows, stairs, cornice, cabin making and conventional methods in architectural drawing. Lab. 3.

2. **History of Architecture.** I; 3 cr.

Architectural design from the early period to modern times; evolution of architectural forms form early Egyptian to modern time Architecture of various countries and periods. Lect. 3.

3. History of Architecture. II; 3 cr.

Rendering of famous examples of period architecture. Lect. 1; lab. 2.

4. Elementary Design. II; 2 cr. Fee $1.

Rendering of the orders and sketch problems involving simple composition. Lab. 2.

5. Building Sanitation. I; 1 cr.

Design and installation of plumbing; removal of waste, sewage disposal, water supply and fixtures in dwellings and public buildings. Lect. 1.

6. Specifications and Working Drawings. I; 3 cr.....Fee $1.

Plan and framing problems; ballon framing, detailing of walls, etc. Lab. 3.

7. Specifications and Working Drawings. II; 3 cr. Fee $1.

Masonry details; stereotomy, and building specifications. Lect. 1; lab. 2.

8. Estimating. I; 2 cr.

Estimating building costs. Lect. 2.

10. Architectural Decoration. I; 2 cr.

Interior and exterior ornamental design and finish of buildings. Lab. 2.

11. Steel Mill Building. II; 2 cr. Prerequisites Civil Engineering 28, 29.

Design of trusses in framed bents; three hinged arches; mill building construction, slow burning and fire proof construction, specifications and contracts. Lect. 1; lab. 1.

12. Thesis. II; 5 cr.

13. Household Architecture. II; 2 cr.

Elective for students in home economics. Lect. 2.

CHEMICAL ENGINEERING

Professor Cobleigh, Assistant Professor Bogue, Instructor Hytree.

The chemical engineering course provides for a thorough training in this particular field of work, and deals with the application of chemistry and electro-chemistry to manufacture.

In the first two years the student is taught mathematics, English, drawing, general chemistry, physics, etc. These are followed in the junior and senior years by a thorough course in industrial processes, given by lectures, supplemented by laboratory instruction.

The work includes a thorough study of the manufacture of such materials as cements, glass, fertilizers, explosives, alkalies, acids, paints, sugar, paper, etc.

Special attention is given to heat and its application to industrial processes; to the manufacture of gases and the by-products of gas works.

The above work is supplemented by courses in electrical engineering, steam engineering, etc.

Inspection trips are taken to some of the larger industrial plants of Montana in order that the student may examine the work as actually done in manufacturing plants.

14. Industrial Chemistry. Yr. 10 cr. Prerequisites Chemistry 3, 4, 5. Fee $8 per semester. Mr. Cobleigh.

General operations common to many chemical industries such as crushing, grinding, calcination, fusion, distillation, filtration, crystallization, etc., and the types of machinery used in these operations. Inspections and reports on various industrial plants in the state. Lect. 3; lab. 2.

17. Fuel Analysis. II; 3 cr. Prerequisite Chemistry 14. Fee $8. Mr. Cobleigh.

Production and analysis of solid, liquid, and gaseous fuels, illuminating gas, and lubricating oils.

18. Water Analysis. II; 4 cr. Prerequisites Chemistry 1, 2, 3 first semester. Fee $8. Mr. Cobleigh.

Chemical examination of potable waters, of water for industrial purposes and steam raising, of sewages, and of air. Water purification and softening, and sewage treatment; interpretation of water analysis.

19. Physical Chemistry. I; 4 cr. Prerequisite Chemistry 3. Mr. Hytree.

Theoretical chemistry including the following topics: Stoicheometry; gas laws; kinetic theory of gases, radioactivity; electron theory, colloids, osmotic pressure, theory of solution, phase rule, equilibrium in electrolytes, and electro chemistry.

20. Seminar. Yr. 2 cr. Mr. Cobleigh, Mr. Bogue.

Each student will be required to make abstracts of articles on assigned subjects from the leading journals, and present them at weekly meetings of the students and department instructors where the topics are freely discussed. Students are thus kept in touch with the progress of the science.

21. Thesis. Yr. 4 cr. Mr. Cobleigh, Mr. Bogue, Mr. Hytree.

Students in the chemistry course may in the senior year prepare a graduate thesis on some subject which will involve considerable work and originality.

IRRIGATION ENGINEERING

Professor Conkling, Assistant Professor Snow.

The course in irrigation engineering will meet the needs of those who wish to become proficient in the construction, operation and maintenance of irrigation systems.

Following the freshman and sophomore years, there are courses in irrigation engineering dealing with the principles of irrigation, to

location of irrigation systems, the manner of supplying, storing, conveying and distributing irrigation water.

Special attention is also given to hydraulic engineering, as it is important that a student in this course should be thoroughly familiar with rainfall, drainage area, and water power development. These courses include thorough laboratory work.

In order that the student may become thoroughly acquainted with the subject, the courses in irrigation engineering are supplemented by such courses in agriculture as are necessary to understand the purposes for which water is used on the farm and the general management of irrigated lands, as for example; field crops, soil physics and farm management.

1. Irrigation Engineering. I; 3 cr. Mr. Conkling.

History of irrigation; the principles of irrigation and location of irrigation systems; details of irrigation systems. Lect. 3.

2 Irrigation Engineering. II; 3cr. Prerequisites Irrigation Engineering 1, 4. Mr. Conkling.

Manner of supplying, storing, conveying and distributing irrigation water; irrigation laws; management of irrigation systems. Lect. 3.

3. Canal Management. II; 3 cr. Prerequisite Irrigation Engineering 2. Mr. Snow.

Canal management, seepage and drainage. Lect. 3.

4. Hydraulics. II; 3 cr. Prerequisites Mathematics 1, 2, 4; Physics 1, 2. Mr. Conkling.

Theoretical hydraulics, hydraulic measurements; flow of water through orifices, over weirs, through pipes, conduits and canals. Lect. 3

5. Hydraulic Engineering. II; 3 cr. Prerequisite Irrigation Engineering 4. Mr. Snow.

Precipitation, drainage area, runoff, water power development. Lect. 3.

6. Hydraulic Laboratory. II; 1 cr. Prerequisite Irrigation Engineering 4. Mr. Conkling.

Flow of water over weirs, through nozzles and pipes, etc. Flow of water in open channels. Lab. 1.

7. Pumping for Irrigation. II; 3 cr. Mr. Conkling.

Small rotary and reciprocating pumps. Steam, gas and oil engines used for pumping. Electric pumps. Lect. 3.

8. Seminar. II; 1 cr. Mr. Conkling, Mr. Snow.

Current literature, reports and discussions.

9. Thesis. II; 3 cr. Mr. Conkling, Mr. Snow.

10. Canal Surveying. II; 3 cr. Prerequisite Civil Engineering 1. Snow.

Theory and practice of canal surveying, computation of earth work, and field location of canals for irrigation. Lect. 1; field work 2.

College of Applied Science.

The departments comprised in the College of Applied Scienc have a two-fold duty to perform.

(1) They give instruction and training in the fundamenta sciences as applied in agriculture, engineering and home economic A large and important part of the student's work in these major div sions of the institution is given in the science departments.

(2) They also offer several courses of instruction in which th main object is to prepare specialists in the various branches of th basic sciences. These courses also give an excellent general trainin and may be taken by those students of agriculture, engineering ar home economics, who desire to give more attention to the fund mental and less to the more specialized branches of agriculture, e gineering and home economics.

The courses of instruction in the college of applied science, ea leading to the degree of bachelor of science, are as follows:

1. Botany and Bacteriology.
2. Zoology and Entomology.
3. Chemistry.
4. Industrial Chemistry.

Recognizing that beginning students will be benefited by h opportunity to spend at least one year in the institution befo committing themselves to a line of study to be followed, the work in the freshman year has been made the same in courses 1, 2, and 3, while in course 4 the freshman year is like that of the engineering course. During his first year the student takes up a considerable variety of studies and often learns what line of work he is best adapted for. At the opening of the sophomore year he can change courses within the same group without loss of time. Again, the freshman year in the agricultural courses, listed elsewhere in the catalog, is so much like the freshman year in the first three courses that usually a change in either direction can be made without inconvenience. In the same way changes can be made between the industrial chemistry course and those in engineering.

COURSE IN BOTANY AND BACTERIOLOGY.

FRESHMAN YEAR.

First Semester.		Second Semester	
nglish Comp. (Eng. 1)	3	English Comp. (Eng. 1)	3
eneral Chem. (Chem. 1)	4	General Chem. (Chem. 1)	4
eneral Botany (Bot. 1)	5	General Des. Phys. (Phys. 1a)	5
ig. and Logs. (Math. 2a) —or— atistics (Math. 8)	3	Elective	4 to 6
ective	2 to 3	Military Drill or Physical Education	1
ilitary Drill or Physical Education	1		
	18 to 19		17 to 19

SOPHOMORE YEAR.

xpository Comp. (Eng. 2)	2	Expository Comp. (Eng. 2)	2
rganic Chemistry (Chem. 5)	4	Agr. Chemistry (Chem. 7)	5
ertebrate Zoology (Zool. 1)	4	Economic Entomology (Zool. 4)	4
Field Crops (Agron. 1)	4	Geology (Geol. 1)	3
Fruit Growing and Gardening (Hort. 10)	4	Systematic Botany (Bot. 2)	4
ilitary Drill or Physical Education	1	Military Drill or Physical Education	1
	19		19

JUNIOR YEAR

dvanced Comp. (Eng. 3) —or— nglish Literature (Eng. 10)	2	Advanced Comp. (Eng. 3) —or— English Literature (Eng. 10)	2
eneral Bacteriology (Bot. 12)	5	San Bacteriology (Bot. 13)	2
uant. Anal. (Chem. 3)	4	Plant Physiology (Bot. 3)	4
eteorology (Phys. 10)	3	Plant Pathology (Bot. 4)	4
ective	2 to 5	Oragnic Evolution (Zool. 9)	2
		Elective	2 to 4
	17 to 19		17 to 19

SENIOR YEAR

conomics (Econ. 3)	2	Economics (Econ. 3)	2
sychology (Phil. 1)	3	Sociology (Econ. 4)	3
esis (Bot. 11)	5	Advanced Econ. Ent. (Zool. 6) —or—	4
ective	7 to 9	Phys. and Anatomy (Zool. 3)	5
		Thesis (Bot. 11)	5
		Elective	3 to 5
	17 to 19		17 to 19

Women may elect other subjects.

COURSE IN CHEMISTRY.

Options:

(a) Agricultural chemistry.
(b) Food chemistry.
(c) Bio-chemistry.

FRESHMAN YEAR

First Semester		Second Semester	
English Comp. (Eng. 1)	3	English Comp. (Eng. 1)	
Trigonometry (Math. 2)	3	General Chem. (Chem. 1)	
General Chem. (Chem. 1)	4	Agricultural Physics (Phys. 1a)	
General Botany (Bot. 1)	5	Military Drill or Physical Education	
Military Drill or Physical Education	1	Elective	4 to
Elective	2 or 3		
	18 or 19		17 to

SOPHOMORE YEAR

Quantitative Anal. (Chem. 3)	5	Expository Comp. (Eng. 2)	
Expository Comp. (Eng. 2)	2	Quantitative Anal. (Chem. 3)	
Invertebrate Zoology (Zool. 1)	4	Animal Physiology (Zool. 3)	
Military Drill or Physical Education	1	Military Drill or Physical Education	1
Elective	5 or 7	Elective	4 or
	17 to 19		17 to

JUNIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	
Organic Chemistry (Chem. 5)	5	Advanced Organic Chemistry (Chem. 9)	
Bacteriology (Bot. 12)	5	Sanitary Bacteriology (Bot. 13)	
Organic Analysis (Chem. 4)	4	Organic Analysis (Chem. 4)	
Elective	2 to 3	Elective	5 t
	18 to 19		17 t

SENIOR YEAR

Industrial Chem. (Chem. 14)	5	Animal Nutrition (Chem. 11)	
Seminar (Chem. 20)	1	Seminar (Chem. 20)	
Physical Chem. (Chem. 19)	4	Water Analysis (Chem. 18)	
Elective	7 to 12	Elective	9 t
	17 to 19		17 t

COURSE IN INDUSTRIAL CHEMISTRY.

FRESHMAN YEAR

First Semester		Second Semester	
English Comp. (Eng. 1)	3	English Comp. (Eng. 1)	3
Algebra (Math. 1)	3	Analytical Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	General Chem. (Chem. 1)	4
General Chem. (Chem. 1)	4	Military Drill or Physical Education	1
Military Drill or Physical Education	1	Elective	5 to 6
Elective	5 to 6		
	18 or 19		18 or 19

SOPHOMORE YEAR

Calculus (Math. 4)	5	Calculus (Math. 4)	5
General Physics (Phys. 1)	3	General Physics (Phys. 1)	3
Physical Meas. (Phys. 2)	2	Physical Meas. (Phys. 2)	2
Quantitative Anal. (Chem. 3)	5	Quantitative Anal. (Chem. 3)	5
Military Drill or Physical Education	1	Military Drill or Physical Education	1
Elective	2 to 3	Elective	3 to 4
	18 to 19		18 to 19

JUNIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Organic Chemistry (Chem. 5)	5	Advanced Organic Chemistry (Chem. 9)	4
Mineralogy (Geol. 2)	3	Sound and Light (Phys. 3)	2
Electricity and Magnetism (Phys. 5)	4	Physical Meas. (Phys. 4)	2
Organic Analysis (Chem. 4)	4	Organic Analysis (Chem. 4)	4
		Elective	4 to 5
	18		18 to 19

SENIOR YEAR

Industrial Chem. (Chem. 14)	5	Industrial Chem. (Chem. 14)	5
Physical Chem. (Chem. 19)	4	Seminar (Chem. 20)	1
Seminar (Chem. 20)	1	Fuel Analysis (Chem. 17)	3
Elective	7 to 9	Elective	8 to 10
	17 to 19		17 to 19

COURSE IN ZOOLOGY AND ENTOMOLOGY.

FRESHMAN YEAR

First Semester		Second Semester	
English Comp. (Eng. 1)	3	English Comp. (Eng. 1)	3
General Chem. (Chem. 1)	4	General Chemistry (Chem. 1)	4
General Botany (Bot. 1)	5	General Physics (Phys. 1a)	5
Trig. and Log. (Math. 2a) —or— Statistics (Math. 8)	3	Elective	4 to 6
Elective	3	Military Drill or Physical Education	1
Military Drill or Physical Education	1		
	19		17 to 19

SOPHOMORE YEAR

Expository Comp. (Eng. 2)	2	Expository Comp. (Eng. 2)	2
Organic Chemistry (Chem. 5)	4	Agricultural Chem. (Chem. 7) —or—	5
Invertebrate Zoology (Zool. 1)	4	Animal Nutrition (Chem. 11)	3
*Field Crops (Agron. 1)	4	Geology (Geol. 1)	3
*Fruit Growing and Gardening (Hort. 10)	4	Systematic Botany (Bot. 2)	4
Military Drill or Physical Education	1	Entomology (Zool. 4)	4
		Military Drill or Physical Education	1
	19		19

JUNIOR YEAR

Advanced Comp. (Eng.) —or— Literature (Eng. 10)	4	Advanced Comp. (Eng. 3) —or— Literature (Eng. 10)	2
General Bacteriology (Bot. 12)	5	Animal Physiology and Anatomy (Zool. 3)	5
General and Systematic Entomology (Zool. 5)	4	Plant Physiology (Bot. 3)	4
Vertebrate Zoology (Zool. 2)	4	Advanced Economic Entomology (Zool. 6)	4
Elective	2 to 4	Elective	3 to 4
	17 to 19		17 to 19

SENIOR YEAR

Psychology (Phil. 1)	3	Sociology (Econ. 4)	2
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Embryology (Zool. 13)	4	Plant Pathology (Bot. 4)	4
Thesis (Zool. 10)	5	Thesis (Zool. 10)	5
Elective	3 to 5	Elective	3 to 5
	17 to 19		17 to 19

*Women may elect other subjects.

Departments of Instruction

BOTANY AND BACTERIOLOGY

Professor Swingle, Assistant Professor Jennison, Assistant Professor Foote.

Botany and bacteriology are among the sciences most fundamental to agriculture. Through botany we learn of the different kinds of plants, their relationships, structure, nutrition, growth and reproduction, and the fungous parasites responsible for many plant diseases. Through bacteriology, we learn of plant and animal diseases and of important chemical changes brought about by micro-organisms in soil, dairy products, silage and other kinds of organic matter. While botany and bacteriology have other aspects besides those relative to agriculture the latter are especially emphasized here.

The four-year course leading to a degree in botany and bacteriology has two major purposes aside from its disciplinary value. First, to train men for a professional career in botany, plant pathology, agri cultural bacteriology and related subjects; second, to prepare students for the study of medicine in other institutions. With a judicious selection of electives this is a very good premedical course.

Every effort is made to maintain in this course the high standard found in similar courses of undergraduate work in the larger universities. A number of the best students get the additional opportunity of working in the laboratories of the experiment station, where, in addition to making part of their expenses, they can become familiar with the methods used in research work in this department.

This course is characterized by a liberal amount of work in the other sciences, especially chemistry, and enough elective space for courses in applied agriculture, language, etc.

1. **General Botany.** I; 5 cr. Fee $2. Prerequisite to other botany courses. Mr. Swingle, Mr. Foote.

Survey of the entire plant kingdom, and under each group of plants is discussed the structure, physiology, evolution, life history, and economic significance of representative examples. Lect. 3; lab. 2.

2. **Systematic Botany.** II; 4 cr. Prerequisite Botany 1. Fee $3. Mr. Swingle, Mr. Foote.

Herbarium work, and field excursions. Lect. 2; lab. 2.

3. **Plant Physiology.** II; 4 cr. Prerequisites Botany 1, Physics 1a, Chemistry 5. Fee $6. Mr. Foote.

Nutrition, growth, reproduuction, and movement in plants, especially the higher forms. Lect. 1; lab. 3.

4. **Plant Pathology.** II; 4 cr. Prerequisites Botany 1, 12. Fee $3. Mr. Swingle.

Plant diseases, including the relations of host and parasites, immunity and susceptibility of host and nature of diseases not caused by parasites. Lect. 1; lab. 3.

11. Thesis. Credits variable to 5 per semester. Fee $3. Mr. Swingle.

Open to seniors in the botany and bacteriology course, and others who have had sufficient preparation.

12. General Bacteriology. I; 5 cr. Prerequisites Chemistry 1, one course in botany or zoology. Fee $7. Mr. Swingle, Mr. Foote.

Structure, physiology and classification of bacteria, their growth in nutrient media and methods of bacteriological technique. Relation of bacteria to agriculture, to human and animal pathology, to the arts and industries. Lect. 2; lab. 3.

13. Sanitary Bacteriology. II; 2 cr. Prerequisites Botany 1. Mr. Foote.

Treating of infectious diseases. Sources and modes of infection for self protection and the protection of others. Lect. 2.

CHEMISTRY

Professor Cobleigh, Assistant Professor Bogue, Instructor Hytree, Mr. Burket.

The applications of chemistry to the various phases of agriculture, to engineering and to many modern industries, make this science an important one in a technical school. The fundamental courses of the science should be thoroughly taught in order that the student may have sufficient training and independence to apply his knowledge to practical operations.

Two college courses in chemistry are offered by the science division: I. Chemistry; II. Industrial Chemistry. Electives are offered in each year of the course in order that the student may adapt his training, to one of the following special fields. The student must elect one of the following options.

a. Agricultural Chemistry. Electives should be chosen from the various sub-courses in agriculture, biology, chemistry and language. This will give the student an excellent training in scientific agriculture and prepares for positions in agricultural colleges and experiment stations, and the government service.

b. Food Chemistry. Electives should be chosen from home economics courses, biology, chemistry, and language.

c. Bio-Chemistry. Electives should be taken mainly from biology, chemistry and language. This course prepares students for positions in state and municipal food and hygienic laboratories, in water purification works and in sewage disposal plants.

1. General Chemistry. Yr. 8 cr. Fee $8 per semester. Mr. Cobleigh, Mr. Bogue, Mr. Hytree and assistants.

Fundamental laws of chemistry and descriptive chemistry of the non-metallic elements. Two sections. Lect. 2; lab. 5.

Section I is for students who offer units in high school chemistry for entrance to the college.

Section II for students who have had no instruction in chemistry in the secondary schools.

Two sections are united the second semester. Chemistry of the metallic elements and qualitative analysis of salts, mixtures, minerals and substances of common interest. Lect. 2; lab. 5.

3. Quantitative Analysis. Yr. 8 or 10 cr. Prerequisite Chemistry 1. Fee $8 per semester. Mr. Bogue.

Analytical chemistry and chemical calculations. Gravimetric and volumetric methods of analysis, and calibration of measuring apparatus. Special topics, quantitative procedures. Elective for students in agriculture, engineering, and home economics. Lect. 2; lab. 2 or 3.

4. Organic Analysis. Yr. 8 cr. Prerequisites Chemistry 3, 5. Fee $8 per semester. Mr. Cobleigh, Mr. Bogue.

Analysis of organic substances and agricultural products. Elective for students in agriculture and home economics.

5. Organic Chemistry. I; 4 or 5 cr. Prerequisite Chemistry 1. Fee $8. Mr. Hytree.

Compounds of aliphatic and aromatic series. Lect. 3; lab. 1 or 2.

6. Advanced Inorganic Chemistry. Yr. 6 cr. Prerequisites Chemistry 3, 5. Mr. Bogue.

Study of the elements according to the periodic classification of Mendeleef.

7. Agricultural Chemistry. II; 5 cr. Prerequisite Chemistry 5. Fee $10. Mr. Bogue.

Composition and reactions of soils, preparation and valuation of fertilizers, insecticides, and fungicides, examination of dairy products, and problems of farm sanitation. Lect. 2; lab. 3.

8. Food Chemistry. II; 3 cr. Prerequisite Chemistry 5. Fee $8. Mr. Cobleigh.

Composition of foods, food production and preservation, food legislation and inspection. Lect. 2; lab. 1.

9. Advanced Organic Chemistry. II; 4 cr. Prerequisites Chemistry 3, 5. Mr. Hytree.

Organic preparations more advanced than chemistry 5. Chemistry 9 to be taken by all students who make chemistry their major subject. Lect. 2; lab. 2.

11. Animal Nutrition. II; 3 cr. Prerequisite Chemistry 5. Fee $6. Mr. Hytree.

Functions of fats, carbohydrates, protein and salts in nutrition to

gether with a study of the chemistry and digestion and metabolism. Lect. 2; lab. 1.

12. Engineering Chemistry. I; 3 cr. Prerequisite Chemistry 1. Fee $6. Mr. Cobleigh.

Chemistry and production of lime, mortar, cement, refractory materials, iron, steel and copper. Qualitative and approximate quantitative examinations of the materials listed above as an aid in studying their chemical properties. Lect. 2; lab. 1.

14. Industrial Chemistry. Yr. 10 cr. Prerequisites Chemistry 3, 4, 5. Fee $8 per semester. Mr. Cobleigh.

Operations common to many chemical industries such as crushing, grinding, calcination, fusion, distillation, filtration, crystalization, etc., and the types of machinery used in these operations. Inspections and reports on various industrial plants in the state. Lect. 3; lab. 2.

17. Fuel Analysis. II; 3 cr. Prerequisite Chemistry 3. Fee $8. Mr. Cobleigh.

Production and analysis of solid liquid and gaseous fuels, illuminating gas, and lubricating oils.

18. Water Analysis. I or II; 2 or 4 cr. Prerequisites Chemistry 1 and first semester of Chemistry 3. Fee $8. Mr. Cobleigh.

Chemical examination of potable waters, of water for industrial purposes and steam raising, of sewages, and of air. Water purification and softening, and sewage treatment, and also the interpretation of water analyses.

19. Physical Chemistry. I; 4 cr. Prerequisite Chemistry 3. Mr. Hytree.

Theoretical chemistry, including the following topics: Stoichometry, the gas laws; kinetic theory of gases, radioactivity, the electron theory, colloids, osmotic pressure, the theory of solution, phase rule, equilibrium in electrolytes and electro chemistry.

20. Seminar. Yr. 2 cr. Mr. Cobleigh, Mr. Bogue.

Each student will be required to make abstracts of articles on assigned subjects from the leading journals, and present them at weekly meetings of the students and department instructors where the topics are discussed.

21. Thesis. Yr. 4 cr. Mr. Cobleigh, Mr. Bogue, Mr. Hytree.

Students in the chemistry course may in the senior year prepare a graduate thesis on some subject which will involve considerable laboratory work and originality. Thesis subjects may be selected from the following branches of chemistry: Industrial, engineering, agricultural, analytical organic, physiological, and sanitary.

GEOLOGY.

Assistant Professor Bogue

The subjects of mineralogy and geology are important not only to the student of general science, but also to those who are specializing along some particular applied line. Here the student or agriculture gains an insight into the nature of soil as merely one particular phase of the broader subjects of rock formation, and disintegration, and from his knowledge of rocks, rock forming minerals, and the changes which these minerals undergo gains the ability to classify soils in a systematic manner. The engineer is enabled both to distinguish between the various types of rocks and minerals, and also to foresee how a given constructive material will withstand various conditions of weathering, and other destructive agents. The science student, in any field, finds in geology and mineralogy a history of the nature and origin of all the materials with which he comes in contact, and having command of such data he approaches his subject in a well prepared and intelligent manner.

The department museum, containing an excellent collection of minerals, rocks, and fossils, is constantly drawn upon for illustrative material. In addition, the publications of the United States Geological Survey are at the command of the student, and are used as references in connection with special topics.

1. General Geology. II; 3 cr. Prerequisite Chemistry 1.

Application of the science to agriculture and engineering. Rocks and rock forming minerals and their classification. A trip to Morrison Cave, an interesting formation lying about fifty miles west of Bozeman, will be included in the field work.

2. Mineralogy. I; 3 cr. Prerequisite Chemistry 1.

Crystallography, and the classification and identification of the more important minerals and rocks.

MATHEMATICS

Professor Tallman, Instructor Bull.

The students in this department have access to the following journals: American Journal of Mathematics (complete set); Annals of Mathematics (from 1900); Bulletin of American Mathematical Society (1898 to date); also about 200 volumes of recent treatises on mathematics. It may also be mentioned that our library is especially well equipped with treatises and journals of applied mathematics found in the libraries of the engineering and physics departments.

Only a selection of courses 10 and 14 will be given each year, that being chosen for which most students apply. The special object of our work here is to make the course in applied mathematics complete,

and the work in pure mathematics will have as its object the laying of a good foundation for the more advanced work in applied mathematics. Those desiring to do work which is not given below may, upon consultation with the professor in charge of the department arrange for other advanced courses, such as theory of functions, projective geometry, etc., if there is sufficient demand.

1. Algebra. I; 3 cr. Mr. Tallman.

Review of radicals and quadratic equations, progressions, arrangements and groups, binomial theorem, theory of limits, under-determined co-efficients, logarithms and introduction to the theory of equations.

2. Plane Trigonometry. I; 2 cr. Miss Bull.

For engineering and science students.

2a. Plane Trigonometry and Logarithms. I; 3 cr. Miss Bull.

For agricultural and home economics students.

3. Analytical Geometry and Calculus. II; 5 cr. Mr. Tallman.

Geometry of the straight line and conic sections coupled with elements of differential calculus.

4. Analytical Geometry and Calculus (continued.) Yr. 9 cr. Mr. Tallman.

Differential and integral calculus. Problems in analytical geometry not treated in course 3, especially the geometry of three dimensions and an introduction to differential equations.

6. Astronomy. II; 4 cr. Prerequisite Mathematics 4. Mr. Tallman.

Spherical trigonometry especially applied to astronomical triangle, least squares and probable error and a general survey of descriptive astronomy.

7. Elementary Analysis. I; 3 cr. Mr. Tallman.

Elementary concepts of analytical geometry and calculus of importance to students of the natural sciences and the application of the same to practical problems.

8. Statistics. Yr. 6 cr. Prerequisites Mathematics 4, 7. Mr. Tallman.

Theory of probability, general methods of statistical investigation, application of the theory of probability to statistical data, fitting curves to observations, interpolation, theory of errors, mathematical theory of variation and correlation and application of the principles developed to problems in biology, sociology and economics.

10. Differential Equations. Yr. 6 cr. Mr. Tallman.

Ordinary and partial differential equations with geometrical and mechanical applications.

11. Partial Differential Equations of Mathematics-Physics. Yr. 6 cr. Mr. Tallman.

Course based on Wever's "Die Partiellen Differential Gleichungen der Mathematischen Physic," and Byerley's "Spherical Harmonics."

12. Newtonian Potential. Yr. 4 cr. Mr. Tallman.

Theory of potential, with an introduction to spherical harmonics.

13. Algebra (advanced). Yr. 6 cr. Mr. Tallman.

Extension of course 1. Complex numbers, theory of algebraic functions, etc.

14. Analytical Geometry (advanced). Yr. 6 cr. Mr. Tallman.

Continuation of course 4. Geometry of three dimensions.

15. Thesis. Mr. Tallman.

Students specializing in mathematics are required to present a thesis on some chosen subject.

PHYSICS

Professor Ham, Instructor Kiefer.

The following courses in physics are designed to meet the needs of (1) those students who are preparing to take up some of the more technical studies in engineering or agriculture, (2) those who expect to become physics or science teachers, and (3) those general science students who wish to acquire some of that kind of scientific training which is peculiar to the science of physics alone.

1a. Agricultural Physics. II; 5 cr. Prerequisites Mathematics 2 or 2a. Fee $2. Mr. Ham.

Physical principles involved in the capillary action of soils, the osmetic action of plants, the movements of winds and moisture, the causes of the deposition of dew and the prevention of frost. Lect. 3; lab. 2.

1. Engineering Physics. Yr. 6 cr. Mr. Ham.

More mathematical and technical than physics 1a and particularly designed to meet the needs of students in engineering. Students who have not completed the calculus, mathematics 4, are required to take it during the same year that physics 1 is taken.

2. Physical Measurements. Yr. 4 cr. Fee $1.50 per semester. Mr. Kiefer.

Laboratory course designed to supplement physics 1.

3. Light and Sound. II; 2 cr. Prerequisites Physics 1, 2. Mr. Kiefer.

Theory of light in its application to familiar optical phenomena and to optical instruments. The phenomena and laws of sound.

4. Physical Measurements. II; 2 cr. Fee $2. Mr. Kiefer.

Laboratory course in light and sound to supplement physics 3.

5. Electricity and Magnetism. I; 4 cr. Prerequisites Physics 1, 2, Mathematics 4. Fee $3. Mr. Ham.

Methods for the exact measurements of resistance, electromotive force, current, capacity, and the coefficient of self-induction. Calibration of commercial instruments, insulation, testing, and magnetic measurements. Lect. 2; lab. 2.

6d. Pedagogy of Physics. Yr. 3 cr. Prerequisites Physics 1, 2, 3, 4. Mr. Ham.

Methods of teaching, the selection and performance of effective lecture table and laboratory experiments and practice in presenting the topics covering such experiments to elementary and college classes.

9. Household Physics. I; 3 cr. Fee $2. Mr. Ham.

Physics of ventilation, the lighting and heating of houses, the principles of electric, gas, and water meters. Lect. 2; lab. 1.

10. Meteorology. I; 3 cr. Mr. Ham.

Temperature, wind pressure, and movements of moisture with special reference to Montana conditions.

11. Electron Theory. II; 2 cr. Prerequisites Mathematics 4, 14 credits of college physics. Mr. Ham.

Graduate course open to undergraduates who can satisfy the prerequisites. Not a survey course but a discussion of recent research work.

ZOOLOGY AND ENTOMOLOGY

Professor Cooley, Assistant Professor Spaulding.

Taken as a whole the courses in this department are primarily designed to give training in the zoological branches as they are applied in horticulture, agronomy, animal industry, general agriculture, and home economics. They form a basis for an understanding of the various phases of the development of life and the problems of evolution. They throw light on the problems of social science, and are well designed for purposes of general education.

The department is well equipped with the necessary microscopes, microtomes, photographic apparatus and dark rooms and miscellaneous equipment which permit all courses listed to be given in a thorough manner.

The various animal groups are well represented in the collections. In the museum room are about five hundred skins of mammals and birds, while among the study materials is an unusually full series of marine and fresh water invertebrates.

The insect collections are especially large and useful. Many thousands of pinned specimens are arranged in the cabinets and these together with microscopical slides and alcoholic materials constitute one of the best insect collections in the west.

The library contains a very valuable accumulation of books and pamphlets dealing with zoological subjects. It is especially strong in entomological literature. The more important scientific journals of this country and others are regularly received and has more or less complete sets of back numbers bound and placed on the shelves.

1. Invertebrate Zoology. I; 4 cr. Fee $3. Mr. Spaulding.

Invertebrate animals, including their morphology, development, habits, economic or popular interest and classification. Lect. 2; lab. 2.

2. Vertebrate Zoology. I or II; 4 cr. Prerequisite Zoology 1. Fee $3. Mr. Spaulding.

Vertebrate (chordate) animals, treating in detail the structure and relationships of the different groups; their classification and economic importance. Elective to all students. Lect. 2; lab. 2.

3. Animal Physiology and Anatomy. II; 5 cr. Prerequisite Zoology 1. Fee $3. Mr. Spaulding.

Lect. 3; lab. 2.

4. Economic Entomology. II; 4 cr. Prerequisite Zoology 1. Fee $2. Mr. Cooley.

Anatomy, metamorphosis and classification of insects; study of the various orders and of the principle families with particular reference to the species of economic importance. Lect. 2; lab. 2.

5. General and Systematic Entomology. I; 4 cr. Prerequisite Zoology 4. Fee $2. Mr. Cooley.

Morphology and classification of insects with some consideration of physiology, development, and adaptations. Lect. 2; lab. 2.

6. Advanced Economic Entomology. II; 4 cr. Prerequisite Zoology 4. Mr. Cooley.

Insect pests and insect control. Lect. 3; lab. 1.

7. Advanced Entomology. Yr. credits variable; 6 to 10. Prerequisites Zoology 4, 5, 6. Fee $2 per semester. Mr. Cooley.

Individual instruction to fit the students' needs, including systematic, economic, biological, and library work.

8. Embryology. I; 4 cr. Prerequisite Zoology 2, or 3. Fee $3. Mr. Spaulding.

Foundation and growth of tissues in the vertebrate body, based chiefly on a study of the chick, but including consideration of the development in the mamalia.

9. Organic Evolution. II; 3 cr. Mr. Spaulding.

Evolution theories and their present status; also heredity, variation, natural and artificial selection, adaptations, etc. Lect. 3.

10. Thesis. Credits variable not to exceed 5. Fee $2 to $10. Mr. Cooley.

Seniors in this department and seniors from other courses, who have had sufficient previous training may elect this course.

College of Industrial Arts

Three separate courses leading to the degree of Bachelor of Science, are offered in the College of Industrial Arts. They are home economics, applied art and secretarial work. There is also a course in secretarial work in this college not leading to a degree. The entrance requirements are the same as for the four-year courses and a certificate is granted upon the completion of the course. The purpose of each is indicated by its title and the industrial application of the work is emphasized in each course. The applied art course and secretarial work are open equally for men and women.

Several subjects taught in departments not represented in the college of industrial arts are open to election by students on consent of their adviser. Among these may be mentioned subjects in the college of agriculture, engineering and applied science as the applicant may be qualified for and as the schedule permits.

COURSE IN APPLIED ART

FRESHMAN YEAR.

First Semester		Second Semester	
English Comp. (Eng. 1)	3	English Comp. (Eng. 1)	3
German (10) or (12) or French (1)	4	German (10) or (12) or French (1)	4
General Botany (Bot. 1)	5	Cooking (H. E. 1)	4
Drawing (Art 1)	2	Physiology (Zool. 3)	5
Sewing (H. E. 11)	3	Design (Art 7)	2
Physical Education	1	Physical Education	1
	19		20

SOPHOMORE YEAR

English Literature (Eng. 10)	2	English Literature (Eng. 10)	2
German (10) or (13) or French (2)	4	German (11) or (13) or French (2)	4
History of Art (Art 6)	3	History of Art (Art 6)	3
Drawing (Art 1a)	2	Drawing (Art 1a)	2
Design (Art 7a)	2	Design (Art 7a)	2
Water Color (Art 2)	2	Water Color (Art 2)	2
Handicraft (10-11-12-13)	2	Handicraft (10-11-12-13)	2
Physical Education	1	Physical Education	1
	18		18

JUNIOR YEAR

Interpretive Reading (Eng. 6)	2	Interpretive Reading (Eng. 6)	2
Advanced Design (Art 7b)	2	Advanced Design (Art 7b)	2
Household Physics (Phys. 9)	3	Medieval History (Hist. 2)	3
Medieval History (Hist. 2)	3	Drawing (Art 1b)	2
Drawing (Art 1b)	2	Water Color (Art 2a)	2
Water Color (Art 2a)	2	Handicraft (10-11-12-13)	2
Handicraft (10-11-12-13)	2	Elective	5
Elective	2		
	18		18

SENIOR YEAR

Psychology Phil. 1)	3	Sociology (Econ. 4)	3
Methods (Art. 18a)	2	Methods (Art 18b)	2
Thesis	4	Thesis	4
Elective	8 or 9	Elective	8 or 9
	17 or 18		17 or 18

COURSE IN HOME ECONOMICS

FRESHMAN YEAR

First Semester		Second Semester	
English Comp. (Eng. 1)	3	English Comp. (Eng. 1)	3
German (10) or (12) or French (1)	4	German (10) or (12) or French (1)	4
History (7) or	4	Principles of Cookery (H. E. 1)	4
Trig. (Math. 2a)	3	General Chem. (Chem. 1)	4
General Chem. (Chem. 1)	4	Art (Art 7)	2
Sewing (H. E. 11, 11a)	3	Physical Education	1
Physical Education	1		
	18 or 19		18

SOPHOMORE YEAR

Expository Comp. (Eng. 2)	2	Expository Comp. (Eng. 2)	2
German (11) or (13) or French (1) or (2)	4	German (11) or (13) or French (1) or (2)	4
Organic Chem. (Chem. 5)	4	Food Chem. (Chem. 8)	3
Invertebrate Zoology (Zool. 1)	4	Food Studies (H. E. 2)	4
Dressmaking (H. E. 12)	2	Animal Physiology (Zool. 3)	5
The Home (H. E. 3)	2	Physical Education	1
Physical Education	1		
	19		19

JUNIOR YEAR

Economics (Econ. 3)	2	Sanitary Bacteriology (Bot. 13)	2
Bacteriology (Bot. 12)	5	Textiles (H. E. 13)	2
Textiles (H. E. 13)	2	Economics (Econ. 3)	2
Advanced Cookery (H. E. 4)	2	Dressmaking (H. E. 14)	3
Household Physics (Phys. 9)	3	Costume Design (Art 8b)	2
Household Decoration (Art 8b)	2	—or—	
—or—		Quantitative Chem. (Chem. 3)	4
Quantitative Chem. (Chem. 3)	4	Household Management (H. E. 7)	3
Electives	1 to 3	Animal Nutrition (Chem. 11)	3
		Electives	0 or 2
	17 to 19		17 or 19

SENIOR YEAR

Psychology (Phil. 1)	3	Sociology (Econ. 4)	3
History of H. E. (H. E. 9)	2	Teaching Home Econ (H. E. 8)	4
Dietetics (H. E. 6)	4	Home Problems (H. E. 10)	3 to 5
Art Needlework (H. E. 16)	2	Electives	6 to 9
Art Needlework Design (H. E. 8a)	1		
Electives	4 to 7		
	16 to 19		16 to 19

COURSE IN SECRETARIAL WORK

FRESHMAN YEAR

First Semester		Second Semester	
English Comp. (Eng. 1)	3	English Comp. (Eng. 1)	3
German (10) or (12) or French (1) or Spanish (20)	4	German (10) or (12) or French (1) or Spanish (20)	4
English History (Hist. 1)	3	English History (Hist. 1)	3
Chemistry (Chem. 1)	4	Chemistry (Chem. 1)	4
*Sewing (H. E. 11)	3	Business Correspond. (Sec. 5)	3
Physical Education	1	Physical Education	1
	18		18

SOPHOMORE YEAR

Expository Comp. (Eng. 2)	2	Expository Comp. (Eng. 2)	2
German (1)) or (13) or French (2)	4	German (11) or (13) or French (2)	4
**History (Hist. 5 or 10)	3	History (Hist. 5 or 10)	3
Shorthand (Sec. 1)	4	Shorthand (Sec. 1)	4
Typewriting (Sec. 3)	4	Typewriting (Sec. 3)	4
Physical Education	1	Physical Education	1
	18		18

JUNIOR YEAR

English Literature (Eng. 10)	2	English Literature (Eng. 10)	2
Office Practice (Sec. 6)	4	Business Methods (Sec. 7)	4
Shorthand (Sec. 2)	3	Shorthand (Sec. 2)	3
Typewriting (Sec. 4)	3	Typewriting (Sec. 4)	3
Elective	6	Commercial Law (Sec. 8)	3
		Elective	3
	18		18

SENIOR YEAR

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Psychology (Phil. 1)	3	Sociology (Econ. 4)	3
Accounting (Sec. 9)	3	Accounting (Sec. 9)	3
Shorthand (Sec. 11)	2	Shorthand (Sec. 11)	2
Typewriting (Sec. 12)	2	Typewriting (Sec. 12)	2
Elective	4 to 6	Elective	4 to 6
	16 to 18		16 to 18

*Men will elect another subject.

**Only one of these courses will be given in the sophomore year.

COURSE IN TWO-YEAR SECRETARIAL WORK

FIRST YEAR

First Semester		Second Semester	
English Comp. (Eng. 1)	3	English Comp. (Eng. 1)	3
Shorthand (Sec. 1)	4	Shorthand (Sec. 1)	4
Typewriting (Sec. 3)	4	Typewriting (Sec. 3)	4
*Sewing (H. E. 11)	3	Business Correspondence (Sec. 5)	3
Office Practice (Sec. 6)	4	Business Methods (Sec. 7)	4
Physical Education	1	Physical Education	1
	19		19

SECOND YEAR

Expository Comp. (Eng. 2)	2	Expository Comp. (Eng. 2)	2
History (Hist. 1)	3	History (Hist. 1)	3
Shorthand (Sec. 2)	3	Shorthand (Sec. 2)	3
Typewriting (Sec. 4)	3	Typewriting (Sec. 4)	3
Accounting (Sec. 9)	3	Accounting (Sec. 9)	3
Elective	3	Elective	3
Physical Education	1	Physical Education	1
	18		18

*Men will elect another subject.

Departments of Instruction

APPLIED ART.

Assistant Professor Baldwin, Instructor Moore.

The applied art course is outlined to give a thorough training in rawing and in the use of color. The object of the study being to repare students for studio work as designers, craftsmen, or decora-ors, and also to prepare them to teach drawing and handicraft in lementary, grammar, and high schools. The course includes the tudy of line, form, color, historic ornament, principles of design and omposition and technical methods in applied design. It insures a road foundation of art culture and skill which will enable students o make practical use of their training. Exceptional facilities are of-ered for the study of design and composition and the course is trengthened by the many phases of related art work. Every effort is ıade to teach drawing. The pupil is then encouraged to follow any ne of art work for which he seems best fitted. Applied design, in-erior decoration, handicraft work or teaching.

1. Freehand Drawing. Yr. 4 cr. Fee $.50 per semester. Miss loore.

Drawing from the cast in charcoal, pencil, or pen and ink.

1a. Freehand Drawing. Yr. 4 cr. Fee $.50 per semester. Miss loore.

Continuation of Art 1.

1b. Freehand Drawing. Yr. 4 cr. Fee $.50 per semester. Miss loore.

Continuation of Art 1.

2. Painting. Yr. 4 cr. Prerequisite Art 1. Fee $.50 per sem-ster. Miss Baldwin.

Water Color, oils and tempera. Work from nature and still life.

2a. Painting. Yr. 4 cr. Fee $.50 per semester. Miss Baldwin.

Continuation of Art 2.

3. Architectural Drawing. II; 2 cr. Fee $.50. Miss Baldwin.

Drawing from still life and casts. Study of architectural details, nd sketching from nature. Work executed in pencil, pen and ink, and harcoal.

3a. Architectural Drawing. Yr. 4 cr. Prerequisite Art 3. Fee .50 per semester. Miss Baldwin.

Continuation of Art 3. Problems in composition and design. Work xecuted in pencil, charcoal, wash, and color. Lab. 4.

4. Drawing from Nature. II; 2 cr. Fee $.50. Miss Moore.

Pencil, pen and ink, wash and color. Intended especially for tudents in biology.

6. History of Art. Yr. 6 cr. Miss Baldwin.

Intended especially for students in design. Historic ornament and the classic styles as exemplified in painting, sculpture and architecture.

7. Design. II; 2 cr. Fee $1. Miss Baldwin.

Applied design and use of water colors. Students submit original designs.

7a. Historic Ornament. Yr. 4 cr. Prerequisite Art 7. Fee $.5(per semester. Miss Baldwin.

Historic ornament with analysis of historic examples of design Original problems executed in black and white and in color.

7b. Advanced Design. Yr. 4 cr. Fee $.50 per semester. Miss Baldwin.

Original designs for commercial purposes executed to meet the requirements and conditions of reproduction.

8. Costume Design. II; 2 cr. Fee $1. Miss Moore.

Color and design as applied to dress. History of costume. Students prepare original designs. Lect. 1; lab. 1.

8a. Embroidery Design. I; 1 cr. Fee $.50. Miss Baldwin.

Theory of color and design; original designs for embroidery.

8b. Household Decoration. I; 2 cr. Fee $1. Miss Baldwin.

Color, line, and form as applied to house furnishings. Let. 1; lab. 1

8c. Decorative Periods. Yr. 4 cr. Prerequisite Art 8b. Fee $.5(per semester. Miss Baldwin.

Advanced work in interior decoration. Decorative styles and their adaptation to modern uses. Original designs for interiors executed in color.

9. China Design. Yr. 4 cr. Fee $.50 per semester. Miss Moore

Applied design for decoration of china; study of color.

10. Painting on China. Yr. 4 cr. Fee $5. per semester. Miss Moore.

China is fired in the studio.

11. Leather. Yr. 4 cr. Prerequisite Art 7. Fee $5 per semester Miss Baldwin.

Tooling, modeling and embossing; also use of dyes and stains fo leather.

12. Jewelry. Yr. 4 cr. Fee $5 per semester. Miss Baldwin.

Making of simple and unique jewelry in gold, silver, and in copper Sawpiercing, enameling, repousse and the setting of semi-precious stones.

13. Metal. Yr. 4 cr. Fee $3 per semester. Miss Baldwin.

Work in copper, brass and silver. Raising, saw-piercing, etching hard and soft soldering and riveting. Given alternate years—1917-18

14. Basketry. II; 1 cr. Fee $3. Miss Baldwin.

Making of baskets of reeds and raffia and other suitable materials. Dyes and dying baskets. Use of native materials in original work in basketry.

15. Perspective. I; 2 cr. Fee $.50. Miss Moore.

Principles of angular and parallel view perspective taught by means of freehand sketches and drawings. Work executed in pencil, pen and ink, wash and color. Lect. 1; lab. 1.

16. Composition. II; 2 cr. Fee $.50. Miss Moore.

Art structure as a means of expression. Original compositions in light and dark, line and color. Lect. 1; lab. 1.

17. Practice Work in Teaching. Yr. 4 cr. Fee $.50 per semester. Miss Baldwin.

Teaching drawing, painting, design, and handicrafts.

18a. Methods. I; 2 cr. Fee $.50. Miss Moore.

Methods of teaching drawing, painting and design. Lesson plans and materials.

18b. Methods. II; 2 cr. $.50. Miss Baldwin.

Methods of teaching the handicrafts; metal, jewelry, leather, basketry, wood block painting, and stenciling. Lesson plans. Materials and equipment.

ENGLISH

Professor Brewer, Dean Herrick, Assistant Professor Duddy, Instructor Schwalbe, Mr. Romney.

In all the courses in English, written work plays an important part. That this work may be kept up to the proper grade, it is announced here that in college English work no paper will receive any credit that shows notable carelessness or ignorance in elementary matters of punctuation, grammar, rhetoric, or in the spelling of common words.

1. English Composition. Yr. 6 cr. Mr. Brewer, Mr. Duddy, Miss Schwalbe, Mr. Romney.

Required of all freshmen. Types of prose composition, narration, description, exposition, and argumentation. Selected essays and addresses form the basis of the second semester's work.

2. Expository Composition. Yr. 4 cr. Mr. Brewer.

Intended for students who will go into scientific or technical work. With work in writing, a considerable variety of reading is required in both semesters. Practice in the use of the library.

3. Advanced English Composition. Yr. 4 cr. Mr. Brewer.

Open to juniors and seniors. Systematic reading. Method of the course will be varied to suit the immediate purpose of those who elect it.

5. Argumentation and Forms of Public Address. Yr. 4 cr. Mr. Duddy.

First semester a study of the principles of argumentation with

written and oral application in briefs, forensics, and debates. Second semester, a study of the forms of public address with written and oral practice. Electives for seniors. juniors, and for sophomores who have credit for courses 1. 2. At the pleasure of the instructor, sophomores who are taking English 2 may also elect course 5.

6. The Modern Drama. Yr. 4 cr. Prerequisite English 1, Mrs. Herrick.

Survey of the modern drama in Europe and America, with emphasis on influence of Ibsen and Shaw. Elective for junior and seniors. With the consent of the instructor it may be taken in either semester separately.

10. English Literature. Yr. 4 cr. Mr. Brewer.

General survey course. Large amount of reading is required and more recommended. Written reports. Class room critical reading of English masterpieces. Lectures, recitations, and conferences.

11. English Essayists of the Nineteenth Century. Yr. 4 cr. Prerequisite English 10. Mr. Brewer.

Study of important essayists from Charles Lamb to R. L. Stevenson.

13. Victorian Poetry. Yr. 4 cr. Prerequisite English 10. Mr. Brewer.

Poetry of the Victorian period, with special reference to the work of Alfred Tennyson, Robert Browning, and Matthew Arnold.

Courses 11 and 13 are not both given in the same year. Classes will be organized when a sufficient number of students elect either course.

FRENCH AND SPANISH

Instructor Wallin.

1. French. Yr. 8 cr.

Elements of grammar based on Fraser and Squairs' French Grammar, with constant practice in pronunciation, dictation and conversation. Reading of easy texts.

2. French. Yr. 8 cr.

Review of grammar. Typical fiction and dramas of the nineteenth century. Advanced composition and original theme writing. Conversation and dictation.

3. French. Yr. 6 or 8 cr.

Study of classic French literature of the seventeenth and eighteenth centuries, such as Corneille, Racine, Moliere, LeSage and Voltaire. Collateral reading and reports. Lyric poetry.

20. Spanish. Yr. 8 cr.

Elements of grammar with conversation and special emphasis on pronunciation. Reading of such modern authors as Valera, Alarcon, Galdos and Moratin.

GERMAN

Assistant Professor Cehrs

1. Elementary German. Yr. 8 cr.

Grammar and easy readings, with practice in speaking and writing German. Open to college students who have not had high school or preparatory German.

2. Intermediate German. Yr. 8 cr. Prerequisite German 1.

Modern prose, narrative and dramatic. Grammar review and elementary syntax, written and oral exercises.

3. Advanced Freshman German. Yr. 8 cr.

Classical and modern writers. Selected works of Schiller, Heine, Freytag, Sudermann and others. Conversation, composition and syntax. Open to freshmen who have had two years of high school German.

4. Classics of the Eighteenth Century. Yr. 4 cr.

Masterpieces of Lessing, Goethe and Schiller. (Omitted in 1916-17)

5. Modern German Dramatists. Yr. 4 cr.

Selected dramas of Grillparzer, Hebbel, Sudermann, Hauptmann and others. A rapid reading course. (Given in 1916-17.)

6. Scientific German. Yr. 4 cr. Prerequisites German 10, 11.

For students specializing in science. Rapid reading of scientific prose.

HISTORY

Assistant Professor Brewer

The department has a good supply of maps and charts, and the library is well provided with the best historical works. A reflectoscope is installed in the class room, which is at all times available for showing pictures of historic scenes and objects. A large number of views belonging to the teacher are used in all classes.

1. English History. Yr. 6 cr.

Political history, lectures on the English constitution, development of continental Europe, historical criticism.

2. Medieval History. Yr. 6 cr.

First semester is devoted to topical study with library references, second, to Italy, and the Renaissance with text-book, and pictures. (Not given in 1916-17.)

5. American History. Yr. 6 cr. Prerequisite History 1.

United States history covering the period of constitutional development. Use of the library is required, and student is expected to spend about one-fourth time in the preparation of a paper. Alternates with Medieval history 2.

7. Modern History. I; 4 cr.

Current events, a review of the political and industrial development of the last few decades.

10. Industrial History. Yr. 6 cr. Prerequisite History 1.

Outlines of United States political history. Each semester the student will write a paper on some special line of industry which he either reads upon or personally investigates.

HOME ECONOMICS

Professor Harkins, Assistant Professor Ballinger, Assistant Professor Ford, Instructor Smith.

The object of this course is two-fold. First, to give young women a liberal education with a scientific basis, and to train them along lines pertaining to science, management and care of the home. Second to give training to those who wish to become teachers of home economics or dietitians. This course gives an opportunity for the correlation of arts and sciences with home economics.

In the junior and senior years there is considerable opportunity for electives, which must be chosen with the advice and approval of the class officers. A choice is given in the junior year between art and chemistry. If chemistry is elected, art 8b will be required in the senior year. Electives in the junior and senior years include art, horticulture, demonstration course and millinery. In the senior year, advanced food studies, French, and therapeutic cookery may be chosen. 4 to 8 credits in pure science or history must be elected during the senior year. Those who expect to teach will take home economics 8.

1. Principles of Cookery. II; 4 cr. Fee $4. Miss Harkins.

Selection and preparation of foods. Marketing and care of food materials. More advanced work is given to students who have had high school courses in cooking. Lect. 1; lab. 3.

2. Food Studies. II; 4 cr. Prerequisites Home Economics 1, Chemistry 1, 5. Fee $5. Miss Ford.

Application of the science underlying the selection and preparation of foods. The dishes prepared illustrate the scientific principles involved.

3. The Home. I; 2 cr. Fee $.50. Miss Harkins.

Evolution of the home, modern houses; site, surroundings, construction, heating, ventilating, lighting, water supply, plumbing and drainage. Practice in drawing floor plans of houses.

4. Advanced Cooking. I; 2 cr. Prerequisites Home Economics 1, 2. Fee $5. Miss Harkins.

Menus are planned and meals prepared. Lab. 2.

5. Advanced Food Studies. I; 2 cr. Prerequisites Home Economics 6, Chemistry 11, Botany 12, Physics 9. Fee $4. Miss Ford.

Detailed study of the food principles correlating closely with the work in bacteriology, physics, chemistry, biology, and physiology.

6. Dietetics. I; 4 cr. Prerequisites Home Economics 2, Chemistry 5, Botany 12. Fee $4. Miss Ford.

Human nutrition and metabolism, the relation of food to health and disease, and the construction and preparation of dietaries. Lect. 2; lab. 2.

7. House Management. II; 3 cr. Fee $.50. Miss Harkins.

Purpose of the household, household income, household account and records. Lectures on nursing by a trained nurse. Lect. 3.

8. Teacher Course. II; 4 cr. Fee $1.25. Miss Harkins.

Theory and practice of teaching domestic science and domestic art. Study is made of courses of study in various types of institutions. Courses of study are planned for graded schools, high schools, and colleges. Lesson plans are given especial attention.

9. History of Home Economics. II; 2 cr. Miss Harkins.

Survey of woman's education, origin and development of home economics.

10. Home Problems. II; 3 or 5 cr. Miss Harkins, Miss Ford, Miss Ballinger.

Individual work is required. The student is given an opportunity to carry on original or suggested investigation in food work, or along economic lines pertaining to some phase of the home. Open to seniors only.

11. Sewing. I; 3 cr. Fee $2. Miss Ballinger.

Fundamental principles of hand and machine sewing applied to aprons and undergarments taking measurements, drafting patterns, use of commercial patterns and the computation of cost. Finished garments are the property of the student.

11a. Sewing. I; 3 cr. Fee $2. Miss Ballinger.

For students who have had at least one year of sewing in high school. Special attention is given to different machines and their attachments, designing patterns from foundation drafts. Several garments and one dress are made and clothing budgets kept.

12. Dressmaking. I; 2 cr. Fee $.50. Miss Ballinger.

Designing and drafting patterns and making shirt waists and cotton dresses.

13. Textiles. Yr. 4 cr. Prerequisites Chemistry 1, Home Economics 11, 12. Fee $.75 per semester. Miss Ballinger.

Study of fabrics beginning with their place in primitive life and tracing their development, manufacture and economic value up to the present time. Methods of determining pure and adulterated fabrics, and the chemistry of laundry processes and dyeing.

14. Advanced Dressmaking and Tailoring. II; 3 cr. Fee $.50. Miss Ballinger.

Making of a dress for evening wear and the handling of wool materials.

16. Art Needle Work. I; 2 cr. Fee $.75. Miss Ballinger, Miss Smith.

Stitches used in decorative art. Decoration of household linens, undergarments and dresses. Must be taken parallel with Art 8a.

17. Millinery. II; 2 cr. Fee $1. Miss Ballinger.

Construction and trimming of hats.

18. Special Credits. 1-2 cr. Miss Harkins.

Students who have practice teaching in the Bozeman public schools, the high school, the Deaconess' hospital or the college will be allowed credits not to exceed two.

19. Therapeutic Cookery. II; 1 cr. Fee $.75. Miss Ford.

Setting of the tray and preparation of food adapted to requirements of abnormal cases.

MUSIC

Professor Currier, Professor Nash, Miss Hartman, Mr. Jackson, Mr. Howard.

There is a universal demand that education in music shall be provided for in schools and colleges. Some knowledge of applied music is coming to be more and more a part of liberal culture and the valuable influence of good music in family and social life needs no discussion.

Accordingly the department of music offers to students of the college and others opportunity to pursue under competent instructors the main branches of music study.

Tuition is payable to the secretary of the college in advance. No reduction will be made for absence from lessons or for lessons discontinued. Teachers will make up hours they fail to give according to schedule.

Non resident students of music must be enrolled in other work, so that the total amount is equal in time spent to 18 credits. For such students is recommended the study of home economics, languages, literature, history and art.

The department is closed on the college and national holidays. Lessons falling on these days will not be made up.

No student is permitted to take part in any public performance without consent of the director.

Students of this department will be granted certificates, if desired, testifying to quality and amount of work done.

Recitals are given from time to time by the instructors and advanced students to which admission is free.

PIANO DEPARTMENT

The instruction in piano will comply with the special needs of each individual student, and the courses or music given them to study, will be taken from the works of such standard composers as are recognized by the leading musicians and musical institutions, of the world. Specimen programs illustrating the class of music taught will be sent to anyone interested by the department. Elementary harmony is given with the piano lessons as an aid to the analysis of each piece, which is so necessary in memorizing.

ENSEMBLE AND SIGHT READING

In this branch of instruction lie indispensable elements of musical knowledge and culture. Ensemble playing develops the students' ability in reading at sight, and enables them to acquire an acquaintance with the masterworks of symphonic and orchestral literature, which is ordinarily inaccessible to the music student.

THEORY

Courses in harmony and musical history will be given if the demand justifies.

VOCAL DEPARTMENT

The training and development of the voice proceed hand in hand with the acquisition of musical taste and intelligence.

Methods are adapted to individual needs. The voice is trained for correct placement, artistic tone, flexibility and agility. The possibilities of varied tone qualities for expressional purposes are emphasized and illustrated. The study of vocal technique includes the subjects of breathing, resonance, tone color, correct attack, sustained tones, scales, arpeggios, legato, staccato, embellishments. Various exercises are made use of. Attention is given to elegance of diction.

The goal of singing is the faithful expression of varied emotions. The study and interpretation of the best song literature results in love for and devotion to the highest expressions of both poetry and music.

The cultivation of musical taste and artistic interpretation is effected by study of the best modern and classic art songs, operatic arias, and oratorio selections.

The art of singing is a complex one as so much depends on the intellectual and emotional status of the singer. Hence the singer should aim to acquire general culture, appreciation of the beautiful in the world of thought and emotion as well as in the realm of sound.

VIOLIN DEPARTMENT

The aim of the department is the acquisition of thorough technique and the study of the works of the best masters. Ensemble playing forms an important part of the course.

MUSICAL ORGANIZATIONS

Four musical organizations furnish both instruction for their members and entertainment for college functions.

College Band. The college band of forty-five members, under the instruction of Mr. Louis Howard, is one of the best amateur musical organizations in the state. The college provides instruments, music and instruction. The band is divided into two sections, beginners and experience players. This gives a splendid opportunity for those who have never played and those who have some skill in the use of instruments.

The Orchestra. All violin students who are sufficiently advanced are admitted to the college orchestra and in as much as the orchestra is under the personal direction of the violin instructor it is of a decided advantage to the violin students.

Treble Clef Club. This is a chorus of about twenty voices open to college women upon examination.

Glee Club. A male chorus of about twelve members. These clubs study both popular and high class music, and afford their members diversion and musical training.

TUITION

Piano With Mr. Nash

One half hour lesson per week for one semester	$ 22.00
Two half hour lessons per week for one semester	40.00
Ensemble playing per semester	10.00

Piano With Miss Hartman

One half hour lesson per week for one semester	$ 18.00
Two half hour lessons per week for one semester	34.00

Voice with Mr. Currier.

One half hour lesson per week for one semester	$ 22.00
Two half hour lessons per week for one semester	40.00

Violin With Mr. Jackson

One forty-five minute lesson per week for one semester	$ 27.00
Two half hour lessons per week for one semester	36.00
One hour ensemble lesson per week for one semester	27.00

When students enter late, lessons missed will be deducted at the rate of $1.00 per lesson.

Piano practice on the college pianos may be arranged for at the following rates:

One hour daily per semester	$ 4.50
Additional hour per semester	3.50

PHYSICAL EDUCATON.

Director Bennion.....**Director of Physical Education for Men**
Dean Herrick.....**Director of Physical Education for Women**
Miss McKinney.....**Instructor in Gymnastics for Women**
Mr. Richardson**Instructor in Gymnastics for Men**
Dr. Herbert H. Judd.....**Medical Examiner**

This department is organized to provide the opportunity for the physical betterment of each and every student. Its function is not to reach a selected few, but to develop in all such physical habits as will promote vigor and efficiency.

The work of the department is organized under these:

(a) Educative. (1) To perfect nervous control. (2) To gain mental and moral self-control. (3) To develop muscular strength and endurance.

(b) Hygienic. (1) To aid function and correct undeveloped and deformed parts. (2) To teach right habits of living.

(c) Recreative.

A thorough physical examination will be required of all new students entering the institution. On the basis of the information gained from this examination, suggestions for excuse and advice on health topics will be given each student.

DEPARTMENT FOR MEN

When military drill is not given, physical education (1) will be required of all first year men.

Physical education (3) is required of all sophomores, but may be elected by freshmen.

For required work, regulation gymnasium suits will be demanded.

Students will not be permitted in intercollegiate competition except under such conditions as are outlined by the Faculty Eligibility Committee and the Athletic Council.

1. Physical Education. Yr. 2 cr.
Elementary gymnastics.

2. Physical Education. Yr. no credit.
Recreative gymnastics. Open to juniors and seniors.

3. Physical Education. Yr. 2 cr.
Hygiene. Required of all sophomores.

4. Physical Education. Athletics.

DEPARTMENT FOR WOMEN

The aim of the physical education department for women is to develop each woman to her highest economic value as a unit of society, to the end that when she finishes her college course she may carry forth into life a sane, well balanced, logical mind, high moral char-

acter, and a strong symmetrical properly functioning body, capable of assuming and performing cheerfully and well the duties of cultured womanhood.

Students who are relieved for any reason of the requirements in physical training, shall present four additional credits in some other subject; but the president may, at his discretion, excuse from such requirements any student in the employ of the institution.

1. **Physical Education.** Yr. 2 cr.

Physical examination on entering. The chief aim throughout the year is to establish good posture and carriage and strengthen vital functions. The work will consist of Swedish body building work, some floor tactics, German rythmic dancing and games. Class exercises. 2.

2. **Physical Education.** Yr. 2 cr.

The work for the second year women will consist of lectures and recreational games. Lect. and exercises 2.

The physical education course for the girls of the School of Home Economics and Short Course will include a physical examination on entering, corrective and recreational gymnastics.

Indoor and outdoor tennis courts and a volley ball court are furnished for the women and beginning classes are organized; competitive games are played between classes throughout the year.

All through the two years the course includes lectures on personal hygiene; general deportment for women; dress from the standpoint of health and appearance; the physiology of bodily exercise. The regulation gymnasium suit and shoes, which may be obtained from a local dealer will be required.

WOMEN'S ASSEMBLIES

One hour each week is required of all women enrolled for an assembly meeting. The assemblies are under the supervision of the women of the faculty and include lectures on personal and social hygiene, dress, care of the room, wall decorations, bed-making, habits, etc. This course correlates with the every-day life of the women.

PSYCHOLOGY AND ECONOMICS

President Hamilton.

1. **Psychology.** I; 3 cr.

General view of modern psychology. Materials and methods of psychologicol investigation; growth of the central nervous system, the nature of consciousness, sensory and motory training, higher intellectual faculties and the will.

3. **Economics.** Yr. 4 cr.

Study of the subjects of land, capital, labor, money, coinage, banking, rent, interest, wages, and taxation. Important questions in economics of the present time.

4. Sociology. II; 3 cr.

Origin and history of human society, the various social theories and the laws of human intercourse. Attention is given to such subjects as the family, government of cities, race problems, settlement work, country life, and charity work. Elective.

5. Advanced Economics. I; 3 cr. Prerequisite Economics 3.

Organization of business, problems of labor and capital, methods of securing capital for the development of industries, the work of utility commissions, and other economic and financial questions of importance to engineers and others engaged in the industrial pursuits.

SECRETARIAL STUDIES

Professor Brewer, Instructor Gephart, Instructor Jones.

The secretarial course requires fifteen units of preparation and extends through four years. It is not a university course in commerce, but a vocational course which prepares for commercial and office positions and through these for such positions as private secretary, executive assistant, office manager, etc.

The course includes a thorough grounding in English and at least one modern foreign language, together with work in home economics, science, history and social science. The technical work includes shorthand, typewriting, business and office methods and management, business law, and the principles of accounting. The freshman year is nearly the same as the freshman year in home economics and applied art.

The two-year secretarial course is intended for those students who cannot take the time to complete a four-year course. The completion of a high school course or its equivalent is required for entrance.

1. Shorthand. Yr. 8 cr. Miss Jones.

Fundamental principles of shorthand practice in word building, phrasing and dictation.

2. Shorthand. Yr. 6 cr. Miss Jones.

Practice in writing letters, legal papers, testimony, and miscellaneous matter. A speed of ninety to one hundred words a minute should be reached by the end of this year.

3. Typewriting. Yr. 8 cr. Fee $2.50 per semester. Miss Jones.

Use and care of typewriters. Exercise for the development of proper wrist and finger movements and for the mastery of the keyboard. Practice in letter writing and the use of carbon.

4. Typewriting. Yr. 6 cr. Fee $2.50 per semester. Miss Jones.

Practice in transcribing from shorthand notes and from manuscript. Dictation for the attainment of speed and accuracy; also practice in the use of the mimeograph.

5. **Business Correspondence.** II; 3 cr. Mr. Gephart.

Practical course. Attention is paid to spelling, punctuation, paragraphing and the correct arrangement of materials, both as to form and language.

6. **Office Practice.** I; 4 cr. Mr. Gephart.

Practice with various kinds of office appliances and equipment, such as adding machines, duplicators, filing cases and card systems. Preparing copy for press and proof reading, typography and illustration.

7. **Business Methods.** I; 4 cr. Mr. Gephart.

Business methods, including the principles of business organization, and administration. How to do business with the postoffice, banks, railroads, express, etc.

8. **Commercial Law.** II; 3 cr. Mr. Gephart.

Students will be required to familiarize themselves with the rights and liabilities of parties to common business transactions, as contracts, sales, deeds, mortgages; and with the drawing up and the validity of commercial paper and contracts. Text and cases.

9. **Principles of Accounting.** Yr. 6 cr. Mr. Gephart.

Principles underlying accounting in general.

11. **Shorthand.** Yr. 4 cr. Miss Jones.

Advanced course, including special dictation practice for gaining speed. When possible opportunity will be given to assist in the actual work of an office.

12. **Typewriting—Rapid Dictation.** Yr. 4 cr. Miss Jones.

Additional practice in transcribing from shorthand notes, also copying work for gaining speed on the machine. In addition to regular class work in courses 11 and 12 eighty hours of actual office practice will be required of each student, during the senior year.

Secondary Schools

The department of secondary education is composed of the following schools:

I. School of Agriculture.
 (a) Three-Year Course.

II. School of Home Economics.
 *(a) Four-Year Course.
 (b) Three-Year Course.

III. School of Mechanic Arts.
 *(a) Four-Year Course.
 (b) Three-Year Course.
 (c) Traction and Stationary License Course.

*First year's work is discontinued.

School of Agriculture

The School of agriculture offers practical instruction to the youn men from the farms of Montana who wish to fit themselves for suc cessful farming. The courses offered are intended as a preparatio for life rather than for college. The student is brought into actua contact with the problems connected with the farm and learns tha agriculture is a profession requiring both skill and knowledge.

Students in this school have the privilege of studying a moder dairy in operation including types of the best breeds of dairy cattle a complete poultry plant in operation containing breeds illu trating especially the best laying strains and market fowls; mo ern grain and soil laboratories; model farm buildings and barns, wit pure bred livestock; the experiment station farm; greenhouses an orchards; the large biological, chemical and physical laboratorie and the well-equipped wood and iron shops of the engineering d partment.

The variety of animals included upon the farm affords ampl opportunity to see the various diseases, injuries, etc., encountere in farm animals. In the veterinary building there is provided clinic room, where sick and injured animals are treated, and th student is given the benefits of these demonstrations.

The course extends through three years of six months each an comes in the winter season when the young men can be spared fro farm work. For admission to this school, students must have passe the eighth grade or its equivalent, or give satisfactory evidence t the principal of the school that they are capable of carrying on th work. Young men twenty-one years of age or over will be admitte to the course without having completed the eighth grade provide they have had some practical experience on the farm and possess fair common school education. Those who satisfactorily comple the course will be given diplomas.

SCHOOL OF AGRICULTURE

FIRST YEAR.

First Semester		Second Semester	
English (Eng. f)	4	English (Eng. f)	4
Arithmatic (Math. a)	4	Agricultural Botany (Biol. b)	3
Physics (Phys. b)	5	Vegetable Gardening (Hort. b)	3
Animal Types (An. Ind a)	2	Animal Types (An. Ind. b)	2
Carpentry (M. A. Sa)	2	Farm Machinery (Agron. e)	3
Mechanical Drawing (M. A. k)	2	Carpentry (M. A. Sa)	2
Military Drill or Physical Education	1	Mechanical Drawing (M. A. k)	2
		Military Drill or Physical Education	1
	20		20

SECOND YEAR.

English (Eng. g)	2	English (Eng. 2)	2
Plant Propagation and Ornamental Horticulture (Hort a)	4	Chemistry (Chem. a)	5
Field Crops (Agron. a)	4	Field Crops (Agron. b)	4
Irrigation and Drainage (Agron. f)	2	Breed Types (An. Ind. d)	2
Breed Types (An. Ind. c)	2	Farm Dairying (An. Ind. a)	3
Farm Poultry (An. Ind. e)	3	Forge (M. A. Sb)	2
Forge (M. A. Sb)	2	Military Drill or Physical Education	1
Military Drill or Physical Education	1		
	20		19

THIRD YEAR.

English (Eng. h)	2	English (Eng. h)	2
Farm Management and Accounting (Agron. d)	4	Soils (Agron. c)	4
Fruit Growing (Hort. c)	3	Plant Diseases (Biol. c)	3
Feeding and Management (An. Ind. g)	3	Feeding and Management (An. Ind. h)	3
Animal Breeding (An. Ind. i)	3	Dairy Manufacture (An. Ind. b)	3
Common Diseases (Vet. Sci. k)	4	Farm Motors (M. A. s)	3
	19		18

School of Home Economics

*(a) Four-Year Course.
(b) Three-Year Course.

The School of Home Economics is designed especially to fit young women to become home builders. The well-equipped laboratories, kitchens, sewing rooms, dairy, greenhouses, etc., are admirably fitted for making instruction intensely practical.

The entrance requirements for the three-year course is the completion of the eighth grade in the common schools or the equivalent. A diploma from the four-year course admits a student to the freshman class of the college. The young women who do not continue their studies have a practical training which fits them for home making, and which furnishes an excellent preliminary training for the vocations based upon domestic science and art.

The three-year course in this school extends through three years of six months each. Those who satisfactorily complete the course will be given diplomas.

*The first year's work of this course is discontinued.

COURSE IN HOME ECONOMICS

FIRST YEAR.

First year's work is discontinued.

SECOND YEAR.

Comp. and Rhetoric (Eng b)	4	Comp. and Rhetoric (Eng. b)	4
Plane Geometry (Math. c)	4	Plane Geometry (Math. c)	4
Ele. Botany (Biol. a)	4	Ele. Physiology (Biol. e)	4
Cooking (H. E. g)	4	Cooking (H. E. g)	4
Drawing (Art a)	2	Drawing and Handicraft (Art b)	2
Physical Education	1	Physical Education	1
	19		19

THIRD YEAR.

American Literature (Eng. c)	4	American Literature (Eng. c)	4
Physics (Phys. a)	4	Physics (Phys. a)	4
German (German a)	4	German (German a)	4
Dressmaking (H. E. b)	2	Dressmaking (H. E. b)	4
Household Decoration (Art c)	2	Household Sanitation (H. E. k)	2
Household Sanitation (H. E. k)	2		
	18		18

FOURTH YEAR.

English Literature (Eng. d)	4	English Literature (Eng. d)	4
German (German b)	4	German (German b)	4
Elementary Food and Nutrition (H. E. h)	2	Elementary Food and Nutrition (H. E. h)	2
Algebra (Math. b)	4	Solid Geometry (Math. d)	4
Electives	3 or 4	Electives	3 or 4
	17 or 18		17 or 18

List of electives for the above: Trigonometry (Math. 2a); Metal (Art 13); Basketry (H. E. 14; China Painting (Art 10); History (Hist. d); Embroidery (H. E. d); Home Gardening (Hort. d); Home Dairying (Dairy c); Poultry (A. I. e).

SCHOOL OF HOME ECONOMICS

FIRST YEAR.

First Semester		Second Semester	
English Exercises (Eng. f)	4	English Exercises (Eng. f)	4
Sewing (H. E. a)	2	Sewing (H. E. a)	4
Textiles (H. E. c)	2	Agricultural Botany (Biol. b)	3
Drawing (Art a)	2	Chemistry (Chem. a)	5
Arithmetic (Math. a)	4	Art (Art a)	2
Physics (Phys. b)	5	Physical Education	1
Physical Education	1		
	20		19

SECOND YEAR

English Composition (Eng. g)	2	English Composition (Eng. g)	2
Cooking (H. E. g)	4	Household Sanitation (H. E. k)	2
Dressmaking (H. E. b)	3	Dressmaking (H. E. b)	4
Household Sanitation (H. E. k)	2	Vegetable Gardening (Hort.b)	3
Plant Propagation (Hort. a)	4	Home Dairying (Dairy c)	3
Poultry (A. I. e)	3	Cooking (H. E. g)	4
Physical Education	1	Physical Education	1
	19		19

THIRD YEAR.

Composition and Literature (Eng. h)	2	Composition and Literature (Eng. h)	2
Fruit Growing (Hort. c)	3	Plant Diseases (Biol. c)	4
Soils (Agron. c)	4	Household Management (H.E.j)	4
Home Nursing (H. E. l)	2	Embroidery (H. E. d)	2
Household Decoration (H. E. c)	2	Elementary Food Nutrition (H. E. h)	2
Elective	5 to 7	Elective	4 to 6
	18 to 20		18 to 20

Electives: Metal (Art 13); Basketry (H. E. 14); History (Hist. d).

SCHOOL OF MECHANIC ARTS

*(a) Four-Year Course.

(b) Three-Year Course.

(c) Traction and Stationary License Course.

The School of Mechanic Arts is designed principally for those who wish to do their own mechanical work on the farm, to prepare themselves to become shop foremen, electricians, section bosses, engine men, firemen, contractors, traction engine men, draftsmen, etc.

For admission to the three courses the equivalent of an eighth grade certificate is required.

The large and well-equipped science laboratories, drawing rooms, and shops provide facilities for work that will rank with the best secondary polytechnic schools. The instruction is given by the regular faculty members in their subjects. The four-year course includes the ten units required by the State Board of Education for admission to the freshman year of the state institutions. The remaining units consist for the most part of industrial subjects. A unit consists of work to the amount of four sixty-minute recitations per week, for the period of 36 weeks. Two periods of laboratory, drawing, or shop work shall count as one period.

Those who complete the four-year course in mechanic arts are eligible to enter the freshman class of the college. To those who satisfactorily complete either the three-year or four-year courses diplomas will be given.

The traction and stationary engine license course is introduced for the benefit of those who wish to prepare themselves for the operation of steam machinery, for which a state license is required. Information necessary for the state examination, as prescribed by law is dwelt upon. The state boiler inspector will deliver a course of six lectures each year on the state inspection of boilers, and at the end of each year he will give an examination for traction or third class license to stuudents who have completed the time requirements.

*The first year's work of this course is discontinued.

COURSE IN MECHANIC ARTS.

FIRST YEAR.

The first year's work is discontinued.

SECOND YEAR.

First Semester		Second Semester	
Composition and Rhetoric (b)	4	Composition and Rhetoric (b)	4
Plane Geometry (c)	4	Plane Geometry (c)	4
German (a)	4	Mechanical Drawing (m)	2
Mechanical Drawing (m)	4	Pattern Work (e)	2
Pattern Work (e)	2	Foundry (d)	2
Forge (c)	2	Military Drill or Physical Education (3)	1
Military Drill or Physical Education (3)	1		
	19		19

THIRD YEAR.

American Literature (a)	4	American Literature (c)	4
Physics (a)	4	Physics (a)	4
German (b)	4	German (b)	4
Mechanical Drawing (n)	2	Mechanical Drawing (n)	2
Foundry (d)	2	Machine Work (f)	4
Machine Work (f)	2		
	18		18

FOURTH YEAR.

English Literature (d)	4	English Literature (d)	4
Algebra (b)	4	Solid Geometry (d)	4
Mechanical Design (o)	4	Mechanical Design (o)	4
Machine Work (h)	2	Machine Work (h)	2
Steam Boilers and Engine (a)	4	Steam and Gas Engines (b)	4
or Electrical Practice (a)	4	or Electrical Practice (a)	4
or Inductrial History (e)	3	or Industrial History (e)	3
	17 or 18		17 or 18

SCHOOL OF MECHANIC ARTS.

FIRST YEAR.

First Semester		Second Semester	
English Exercises (Eng. f)	4	English Exercises (Eng. f)	4
Shop Arithmetic (Math. e)	4	Algebra (Math. a)	4
Mechanical Drawing (M. A. 1)	3	Mechanical Drawing (M. A. 1)	3
Forge (M. A. Sb)	3	Forge (M. A. Sb)	3
Carpentry (M. A. Sa)	3	Carpentry (M. A. Sa)	3
Military Drill or Physcal Education (1)	1	Military Drill or Physical Education (1)	1
	18		18

SECOND YEAR.

English Composition (Eng. g)	2	English Composition (Eng. g)	2
Algebra (Math. Sa)	4	Algebra (Math. Sa)	4
Physics (Phys. c)	4	Physics (Phys. c)	4
Pattern Making (M. A. e)	3	Pattern Making (M. A. e)	3
Mechanical Drawing (M. A. m)	3	Mechanical Drawing (M. A. m)	3
Foundry (M. A. d)	3	Forge (M. A. c) or Foundry (M. A. d)	3
Military Drill or Physical Education (3)	1	Military Drill or Physical Education (3)	1
	20		20

THIRD YEAR.

Compositoin and Literature (Eng. h)	2	Composition and Literature (Eng. h)	2
Geometry (Math. c)	4	Geometry (Math. c)	4
Steam Boiler and Practice (M. A. Sp)	5	Steam and Gas Engines (M. A. Sr)	5
Mechanical Drawing (M. A. n)	3	Mechanical Drawing (M. A. n)	3
Machine Work (M. A. f)	3	Machine Work (M. A. f)	3
Leveling (M. A. v)	3	Water Measurement (M. A. y)	3
	20		20

TRACTION AND STATIONARY ENGINE LICENSE COURSE

FIRST YEAR

First Semester		Second Semester	
Shop Arithmetic (Math. e)	4	Algebra (Math. Sa)	4
Mechanical Drawing (M. A. l)	3	Mechanical Drawing (M. A. l)	3
Forge (M. A. Sb)	3	Forge (M. A. Sb)	3
Boilers, Steam and Traction Engines (M. A. Lp)	9	Boilers, Steam and Traction Engines (M. A. Lp)	9
Military Drill or Physical Education (1)	1	Military Drill or Physical Education (1)	1
	20		20

SECOND YEAR.

Algebra (Math. Sa)	4	Algebra (Math. Sa)	4
Physics (Phys. c)	4	Physics (Phys. c)	4
Mechanical Drawing (M. A. m)	3	Mechanical Drawing (M. A. m)	3
Heat (M. A. Lu)	2	Heat (M. A. Lu)	2
Boilers and Auxiliaries (M. A. Lv)	4	Boilers and Auxiliaries (M. A. Lv)	4
Steam Engines (M. A. Lx)	3	Steam Engines (M. A. Lx)	3
Military Drill or Physical Education (3)	1	Military Drill or Physical Education (3)	1
	21		21

THIRD YEAR.

Geometry (Math. c)	4	Geometry (Math. c)	4
Machine Work (M. A. f)	3	Machine Work (M. A. d)	3
Steam Boilers and Auxiliaries (M. A. Lz)	3	Steam Boilers and Auxiliaries (M. A. Lz)	3
Steam and Gas Engines (M. A. Lr)	6	Steam and Gas Engines (M. A. Lr)	6
Electrical Practice (M. A. Lt)	4	Electrical Practice (M. A. Lt)	2
	20		20

Departments of Instruction

AGRONOMY

Professor Atkinson, Assistant Professor Whitcomb, Assistant Professor Currier, Assistant Professor Murdock.

a. Field Crops. I; 4 cr. Mr. Whitcomb.

Methods of growing and producing oats, wheat, flax, rye, and corn. Lect. 3; lab. 1.

b. Field Crops. II; 4 cr. Prerequisite Agronomy a. Mr. Whitcomb.

Forage crops, and grasses. Lect. 3; lab. 1.

c. Soils. I; 4 cr. Mr. Whitcomb.

Formation and classification of soils, including a study of tillage and the methods for keeping up the soil's productiveness.

d. Farm Management and Accounts. II; 4 cr. Mr. Currier.

Practical methods of managing a farm.

e. Farm Machinery. II; 3 cr. Prerequisite Physics d. Mr. Murdock.

Study of the various types of farm machinery. Selection, adjustment and care of farm machinery. Modern farm conveniences, such as telephones, water supply systems, etc.

f. Irrigation and Drainage. I; 2 cr. Prerequisite Physics a. Mr. Murdock.

Methods of irrigating and draining land.

ANIMAL INDUSTRY

Professor Arnett, Professor Schoppe, Professor Welch, Assistant Professor Riley, Mr. Tretsven.

a. Animal Types. I; 2 cr. Mr. Riley, Mr. Tretsven.

Market types of cattle and sheep. Lab. 2.

b. Animal Types. II; 2 cr. Mr. Riley, Mr. Tretsven.

Judging of the market types of dairy cattle, horses and swine. Lab. 2.

c. Breed Types. I; 2 cr. Prerequisite Animal Industry a or b. Mr. Riley.

Breedtypes of cattle and sheep. Lect. 1; lab. 1.

d. Breed Types. II; 2 cr. Prerequisite Animal Industry a or b. Mr. Riley.

Breed types of dairy cattle, horses, and swine. Lab. 1.

e. Farm Poultry. I; 3 cr. Mr. Schoppe.

Various breeds and their adaptability to farm use. Housing, feeding, incubator and brooding. Judging birds, operating incubators and brooders. Lect. 1; lab. 2.

g. Feeding and Management of Live Stock. I; 3 cr. Prerequisites Animal Industry c, d. Fee. $1. Mr. Tretsven.

Methods of feeding and managing cattle and sheep. Methods by which animals are prepared for the show ring. Lect. 2; lab.1.

h. Feeding and Management of Live Stock. II; 3 cr. Prerequisites Animal Industry c, d. Fee $1. Mr. Tretsven.

Methods of feeding, showing and managing horses and hogs. Lect. 1; lab. 2.

i. Animal Breeding. I, 3 cr. Prerequisites Animal Industry c, d. Mr. Riley.

Principles of breeding as directly applied to the farm. Cross breeding, inbreeding, and line breeding.

k. Common Diseases. I; 4 cr. Mr. Welch.

Physiology of the digestive, respiratory and blood vascular systems, in connection with a study of the common diseases. Wounds and their treatement, general conformation and care of the teeth and some of the more common ailments in all species of domestic animals. Care and handling of breeding animals and accidents and diseases attendant upon parturition.

ART

Assistant Professor Baldwin, Instructor Moore

a. Drawing. Yr. 4 cr. Miss Moore.

Freehand drawing from geometric solids and casts. Study of light and shade. Object drawing, in charcoal, pencil, pen and ink. Study of linear perspective with practical exercises in perspective sketching.

b. Drawing. Yr. 4 cr. Miss Moore.

Continuation of course a, with study of design and handicraft.

c. Household Decoration. I; 2 cr. Miss Baldwin.

Study of line, form and color as applied to the furnishing of a home.

BIOLOGY

Professor Cooley, Assistant Professor Spaulding, Assistant Professor Foote.

a. Elementary Botany. I; 4 cr. Mr. Foote.

Foundational knowledge of botanical science and its bearing on every day life.

b. Agricultural Botany. II; 3 cr. Mr. Foote.

Elements of botany, especially with a view to the needs of agricultural students. Classification, structure, physiology and ecology of plants. Lect. 2.

c. Plant Diseases. II; 3 cr. Fee $1.50. Mr. Cooley, Mr. Foote.

Economic importance of plant diseases, causes of such diseases, especially parasitic fungi and bacteria, and methods of control. Especial attention is given to those diseases that are of most importance in Montana. Lect. 2; lab. 1.

e. Elementary Physiology. II; 4 cr. Mr. Spaulding.

Anatomy and physiology of the human body. Nutrition, the blood and circulation, respiration, excretion, nervous system and its function, and the special senses.

CHEMISTRY.

Professor Cobleigh, Assistant Professor Bogue

a. Elementary Chemistry. II; 5 cr. Mr. Bogue.

Lectures with experimental illustrations, and recitation on general elementary chemistry. Special emphasis will be given to the applications of the science to daily life, and to agriculture.

DAIRY HUSBANDRY

Professor Martin

a. Farm Dairying. II; 3 cr. Fee $2.

Dairy problems as applied to building up the dairy herd, care and management of the herd, and marketing dairy products. Applications of the Babcock test, and operation of hand separators. Lect. 2; lab. 1.

b. Dairy Manufacture II; 3 cr. Fee $2.

Farm and factory methods of making butter, cheese and frozen products and preparing them for markets. Preparation and manufacture of dairy products. Lect. 1; lab. 2.

c. Home Dairying. II; 3 cr.

Composition, properties, and uses of milk and its products; care and handling, fermentations, adulterations, modification, ripening of cream for butter making. Manipulation of tests, manufacture of butter, cheese and frozen products. Lect. 2; lab. 1.

ENGLISH.

Professor Brewer, Professor Holst, Instructor Schwalbe, Mr. Romney.

b. Composition and Rhetoric. Yr. 8 cr. Miss Schwalbe.

Variety of practice in description, narration, and exposition of an elementary grade. Written work will be required and a large amount of reading in good books and periodicals. During the latter half of the year time will be ducted to oral composition.

c. American Literature. Yr. 8 cr. Mr. Romney.

Reading of American authors; history of the literature, character of the different periods, and the connection between the literature and other aspects of American history. Considerable amount of written work.

d. English Literature. Yr. 8 cr. Miss Schwalbe.

English authors from the Elizabethan period to the present day, with the greater amount of time devoted to the more recent authors. History of the people and literary chronology; emphasis will be placed on learning how to read books of established worth. Written work.

f. English Exercises. Yr. 8 cr. Mr. Holst.

Practice in spelling, punctuation, note taking, letter writing, and the simpler forms of composition.

g. English Composition. Yr. 4 cr. Mr. Holst.

Paragraph and its development, sentence structure and words. Practice in oral and written composition. Masterpieces are read as a basis for a careful study of good style.

h. Composition and Literature. Yr. 4 cr. Mr. Holst.

Forms of literature. Study and writing of narration, description, exposition, and argumentation. At least one good example of each of the four forms of composition is studied in class.

GERMAN

Assistant Professor Cehrs.

a. Beginning German. Yr. 8 cr.

Pronunciation, grammar, selections in prose and verse with practice in speaking and writing German.

b. Second Year German. Yr. 8 cr.

Texts suitable for second year work; for the most part, the writings of contemporary authors. Memorizing of easy colloquial sentences and poems. Conversation and composition.

HISTORY

Assistant Professor Brewer.

d. General History. Yr. 8 cr.

Greek and Roman history with a brief sketch of Medieval institutions as an introduction to more extended work in Modern history.

e. Industrial History. Yr. 6 cr.

Industrial development taken from the standpoint of boys and girls of high school age is offered as an elective.

HOME ECONOMICS

Professor Harkins, Assistant Professor Ballinger, Assistant Professor Ford, Instructor Smith.

a. Sewing. Yr. 6 cr. Fee $1 per semester. Miss Smith.

Fundamental principles of hand and machine sewing applied to the making of aprons and undergarments: students provide suitable materials. The finished work is the property of the student.

b. Dressmaking. Yr. 6 cr. Fee $.75 per semester. Miss Ballinger.

Designing, cutting and making simple dresses.

c. Textiles. I; 2 cr. Fee $1.50. Miss Ford.

Study of cotton, wool, silk, and linen, in regard to its microscopical structure, physical properties, manner of growth, and manufacture into cloth. Simple tests for adulteration.

d. Embroidery. II; 2 cr. Fee $.75. Miss Smith.

Embroidery of household linens and wearing apparel; weaving rugs and pillows.

g. Cooking. Yr. 8 cr. Fee $3 per semester. Miss Harkins, Miss Smith.

Plain cooking such as: bread, meats, eggs, cereals, soups, salads, preserving fruits, cakes, candy and simple dessert. Visits to the meat market to study cuts of meat. Students are shown how biology and chemistry apply to the preparation of foods. Lect. 2; lab. 2.

h. Elementary Food and Nutrition. Yr. 4 cr. Fee $5 per semester. Miss Ford.

General principles of human nutrition. Some attention is given to invalid cookery.

j. Household Management. II; 4 cr. Fee $.50. Miss Smith.

Expenditure of the income, furnishing with reference to economy and efficiency, also the working out of a number of home problems by each member of the class.

k. Household Sanitation. Yr. 2 cr. Miss Smith.

Location of the house, house plans, finishing and furnishing of the home, from a sanitary standpoint. Source of water supply, and preservation of food.

l. Home Nursing. 1; 2 cr. Miss Harkins.

Care of sick room, making beds, bathing bandaging, emergencies, etc.

HORTICULTURE

Professor Whipple, Assistant Professor Starring.

a. Plant Propagation and Ornamental Horticulture. I; 4 cr Mr. Starring.

Plant propagation with special reference to the methods of multiplying fruit and ornamental plants. The latter part of the course deals

with the simple principles of ornamental planting and ornamental plants adapted to Montana conditions.

b. Vegetable Gardening and Small Fruit Culture. II; 3 cr. Mr. Starring.

Methods of growing, gathering, storing, and marketing the more important vegetable crops; hot bed construction and management; and with the growing of such small fruits as the strawberry, raspberry, blackberry, currants, and gooseberry.

c. Orcharding. I; 3 cr. Prerequisite Horticulture a. Mr. Starring.

Selecting sites, planning and planting, cultivation, irrigation, pruning ,and general care of the orchad, more especially from the standpoint of the home orchard.

d. Home Gardening. I; 4 cr. Mr. Starring.

Elective in the secondary home economics course. Elementary course dealing with the principles of plant propagation, vegetable gardening, small fruit culture, and ornamental gardening. Lect. 4.

MATHEMATICS

Professor Tallman, Instructor Bull.

Sa. Algebra. Yr. 8 cr. Miss Bull.

Offered to the students of the three year mechanic art course.

b. Advanced Algebra. II; 4 cr. Miss Bull.

Simultaneous quadratic equations, graphical representations of simple equations in two variables; theory of indices, (positive, negative, fractional, zero), radicals, etc.

c. Plane Geometry. II; 4 cr. Prerequisite Algebra. Miss Bull.

This includes, in addition to the work given in the standard texts, a large number of original exercises.

d. Solid Geometry. II; 4 cr. Prerequisites Algebra b, Geometry c. Miss Bull.

Geometry of the sphere.

e. Shop Arithmetic. I; 4 cr. Miss Bull.

Designed to develop skill and accuracy in the fundamental processes of arithmetic. Problems will be chosen very largely of the type the student will actually encounter in connection with his mechanical work.

f. Industrial Arithmetic. I; 4 cr. Miss Bull.

Fundamental processes of arithmetic related to the work of farm experience. Mathematical problems connected with the work of the shop and laboratory.

MECHANIC ARTS

Dean Richter, Professor Dearborn, Assistant Professor Challender, Instructor Kately, Instructor Haines, Instructor Miller, Mr. Park, Mr. Homann.

Sa. Carpentry. Yr. 4 cr. Fee $4. per semester. Mr. Challender.

Use and care of carpentry tools. Series of exercises in joinery, followed by practice in framing and rafter and stair cutting. Lab. 4.

Sb. Forge. Yr. 4 cr. Fee $5 per semester. Mr. Kately.

Care and manipulation of fire, iron forging, including the operation of drawing, upsetting, pointing, bending, welding, calculation of stock; implement repairs, plow pointing, manufacture of chains, hooks, clevises, etc. Lab. 4.

c. Forge Work. I; 2 cr. Fee $2. Mr. Kately.

Forging and tempering hand tools, lathe tools, foundry tools, springs, drills and reamers, including annealing and casehardening.

d. Foundry. Yr. 4 cr. Fee $1.50 per semester. Mr. Kately.

Bench and floor moulding in green sand. Casting in white metal, brass, and cast iron are poured for use in the machine shop.

e. Pattern Making. Yr. 6 cr. Fee $2 per semester. Mr. Challender.

Allowances on patterns for draft, shrinkage and finish; construction of patterns for pulleys, hangers, machine parts and pipe fittings, with the necessary core boxes.

f. Machine Work. Yr. 6 cr. Fee $2.25 per semester. Mr. Homann.

Bench work, including chipping, filing, scraping, fitting, soldering, brazing and babbitting. Machine tool work on drill press, shaper, planer and lathe.

h. Machine Work. Yr. 4 cr. Fee $1.50 per semester. Mr. Homann.

Work on lathe, milling machine and grinder, with practice in hardening and tempering taps, dies, cutters and high speed steels.

k. Mechanical Drawing. Yr. 4 cr. Mr. Miller.

Elements of lettering; geometrical constructions, isometric and orthographic representations, working drawings. Farm building construction, bills of material. Details of forms for concerte work, silo construction, plumbing and sanitation. Farm Maps. Lab. 4.

l. Mechanical Drawing. Yr. 4 cr. Mr. Miller.

Lettering. Geometrical construction, freehand sketching of simple machine parts, reproduced in detailed working drawings; orthographic projection.

m. Mechanical Drawing. Yr. 4 cr. Mr. Miller.

Machine and architecteural detail drawing, tracing and blueprinting; isometric and cabinet projection; intersections and develop-

ment of surfaces with applications in roof framing and sheet-metal work.

n. Mechanical Drawing. Yr. 4 cr. Mr. Miller.

Machine drawing and the elementary principles of mechanism; screws, threads, screws and bolts; pulleys and belting, gear tooth curves, gears in train, change gears.

o. Mechanical Design. Yr. 8 cr. Mr. Miller.

Machine drawing and elementary design. Bearings and journals, diferentials and change speed mechanism, gearing, engine parts, quick returns, punches, shears, presses.

p. Steam Boilers and Practice. I; 4 cr. Prerequisites Physics a, Mechanic Arts, k, l, f. Mr. Park.

Construction and operation of steam boilers, and their auxiliaries, physical properties of steam, combustion of fuel, pumps, injectors, feed water heaters, condensers.

Lp Steam Boilers and Practice. Yr. 18 cr. Mr. Richter, Mr. Park.

Four hours recitation and six periods practice per week.

Sp. Steam Boilers and Practice. I; 5 cr. Prerequisite Physics e. Mr. Richter, Mr. Park.

Construction and operation of steam boilers and auxiliaries. Two recitations and three practice periods per week.

r. Steam and Gasoline Engines. II; 4 cr. Prerequisite Mechanic Arts Sa. Fee $2. Mr. Homann.

Construction and operation of steam and gasoline engines and tractors, valves and valve gears, governors; lubricators; indicator cards, indicated horsepower, brake horse power, efficiency.

Lr. Steam and Gasoline Engines. Yr. 12 cr.

Three hours recitation and three periods practice per week.

Sr. Steam and Gas Engines. II; 5 cr. Prerequisite Mechanic Arts Sp. Mr. Homann.

Construction and operation of stationary and tractor steam and gas engines, motor trucks and automobiles. Two recitations and three practice periods per week.

S. Farm Motors. II; 3 cr. Fee $3. Mr. Park.

Motors adapted to use on the farm, particularly the gas engine, with practice in operating and locating troubles. Tractor practice and study of simple stationary installations. Lect. 1; lab. 2.

t. Electrical Practice. Yr. 6 cr. Prerequisite Physics c. Mr. Haines.

Elementary principles of electricity, electric wiring, management and care of electrical machines and apparatus, including dynamos and motors, batteries, electric lights, telephones and telegraph apparatus.

Lu. Heat. Yr. 4 cr. Mr. Richter.

Effects of heat as applied to the operation of the steam boiler and the steam and gasoline engine.

v. Leveling. I; 3 cr.

Determination of slopes and distances. Measurement of plane areas.

Lv. Steam Boilers and Auxiliaries. Yr. 8 cr. Mr. Park.

Continuation of Mechanic Arts Lp applied to stationary boilers.

Lx. Steam Engines. Yr. 6 cr. Mr. Richter, Mr. Park.

Construction and operation of steam engines. Valve gears.

y. Water Measurement. II; 3 cr.

Measurement of water by means of weirs and current meters. Hydraulic rams. Small water power installations.

Lz. Steam Boilers and Auxiliaries. Yr. 6 cr.

Continuation of Mechanic Arts Lv.

PHYSICS

Professor Ham, Instructor Kiefer.

a. Elementary Physics. Yr. 8 cr. Fee $.50 per semester. Mr. Kiefer.

Lectures with experimental illustrations, recitations, assigned problems, and laboratory work in mechanics, sound, heat, light, electricity and magnetism.

b. Elementary Physics. I; 5 cr. Mr. Kiefer.

Experimental lectures, recitations, and assigned problems on mechanics, heat, light, and electricity. Emphasis will be placed upon those subjects that have a direct bearing on applied agriculture.

c. Elementary Physics. Yr. 8 cr. Mr. Kiefer.

Demonstration lectures, assigned problems, and recitations in mechanics, heat, electricity and magnetism, light and sound.

PHYSICAL EDUCATION

Director Bennion, Mr. Richardson, Miss McKinney.

a. Elementary Gymnastics. Yr. 2 cr. Mr. Richardson, Miss McKinney.

General setting up exercises, a small amount of apparatus work, recreative group games, and short talks on personal hygiene. Required of all first year students.

Alumni

With Their Years, Degrees and Present Addresses and Occupations.

Abell, Tracy H., B. S., 1915; Teacher in Victor Consolidated Schools, Victor, Mont.

Alderson, Myrtle, B. S., 1913; Bozeman, Montana, Station Clerk.

Allen, Elbert, B. S., 1903; Attorney at Law, Livingston, Mont.

Alward, Mary L., B. S., 1908; Teacher in Gallatin County High School, Bozeman, Montana.

Annin, James T., B. S., 1911; Part Owner Columbus News, Columbus, Montana.

Baker, Florence, B. S., 1912; Deceased.

Baker, Harold E., B. E. E., 1907; Superintendent Electric Power Co., Naches, Washington.

Bancroft, Raymond E., B. S., 1911; Horticultural Inspector, Billings, Montana.

Bernard, Robert B,, B. S., 1910; Montana Power Co., Butte, Mont.

Bell, James C., B. S., 1911; Superintendent McIntosh Orchard and Ranch Co., Darby, Montana.

Benton, Ralph, B. S., 1906; Associate Professor of Applied Biology, University of Southern California, Los Angeles.

Blessing, John, B. S., 1912; Horticulturist, Bitter Root Valley Orchard Company, Victor, Montana.

Bole, Margaret, B. S., 1913; Clerk, Bozeman Daily Chronicle Office, Bozeman Montana.

Bole, William S., B. S., 1906; Physician and Surgeon, Bozeman, Montana.

Booker, Clinton T., B. S., 1911; Superintendent Great Falls and Missouri River Substations, Montana Power Company, Butte, Montana.

Blankenship, E. V., B. S., 1897; Farming and Stock Raising, Bozeman, Montana.

Brabrook, Ralph, B. S., 1913; Instrument Man, Office of Assistant City Engineer, Indianapolis, Indiana.

Brewer, Lucille, B. S., 1909; Graduate Student, Cornell University, Ithaca, New York.

Breneman, Annie T., B. S., 1907; Instructor in Mathematics, Teton County High School, Choteau, Montana.

Brook, Thomas B., B. S., 1913; Rancher, Ennis, Montana.

Brooks, Roland, B. S., 1915; Abstract Department, American National Bank, Helena, Montana.

Brown, Archie S., B. S., 1910; Electric Expert United States Navy, Mare Island Navy Yards, San Francisco, California.

Brown, Edith E., B. S., 1904; Mrs. John Milloy, Vancouver, B. C.

Buckley, Thomas W., B. S., 1914; Anaconda Copper Company, Anaconda, Montana.

Bull, Edna, B. S., 1909; Mrs. G. W. Kirscher, Townsend, Montana.

Bull, Frieda M., B. S., 1907; M. S., 1909; Instructor in Mathematics, Montana State College, Bozeman, Montana.

Burke, Edmund, B. S., 1907; Chemist and Meteorologist, Montana Agricultural Experiment Station, Bozeman, Montana.

Burkett, Alonza D., B. S., 1915; Assistant, Chemistry Department, Montana State College, Bozeman, Montana.

Butter, Donald, B. S., 1909; Electrical Engineer, General Electric Company, Schenectady, New York.

Caldwell, Thomas O., B. A. C., 1899; Leasing on Gold Reef and Maginnis Mine, Lewistown, Montana.

Carr, Irene H., B. S., 1911; Mrs. Claude Meserve, North Bridgetown, Maine.

Carmichael, Effie, B. S., 1910; Mrs. Vergil A. Spicer, Red Oak, Iowa.

Chaffee, Sarah, B. S., 1906; Mrs. Rudolph Beseke, Rathdrum, Idaho.

Clark, Ben A., B. S., 1911; Farmer, Springdale, Montana.

Clarke, Grace, B. S., 1911; Missionary, Old Umtali, Rhodesia, Africa.

Clark, Olive, B. S., 1913; Graduate Student Simmons College, Boston, Massachusetts.

Cockrel, Irvin, B. S., 1900; Osteopath Physician, New York City.

Coffey, Hazel C., B. S., 1915; Instructor in Home Economics, Montana Wesleyan, Helena, Montana.

Collins, Walter E., B. S., 1902; Trust Officer, State Savings Bank and Practicing Attorney, Butte, Montana.

Cooke, Amy, B. S., 1908; Mrs. George Ambrosefi Mackay, Idaho.

Cook, George, B. S., 1912; Farmer, Bozeman, Montana.

Cowan, Lewis, B. C. E., 1904; Civil Engineer, Bozeman, Montana.

Cullum, Georgia, B. S., 1914; Mrs. George Roosevelt, Ackley, Iowa.

Dawes, Rhoda, B. S., 1913; Hrs. Arthur Seamans, Huntley, Montana.

Daly, Freeman, A., B. S., 1912; Civil Engineer, Choteau, Montana.

Davidson, Lyndall P., B. S., 1915; Special Inspector for the State Board of Health, Bozeman, Montana.

Davidson, Mary E., B. S., 1910; In Settlement Work, Chicago, Illinois.

DeMuth, Maude S., B. S., 1907; Mrs. W. D. Tallman, Bozeman, Montana.

DeMuth, David R., B. S., 1910; Deceased.

Douglas, Stanley, B. S., 1913; Montana Power Company, Canyon Ferry, Montana.

Donaldson, Noble C., B. S., 1912; Assistant in Grain Investigation of U. S. Department of Agriculture, Moccasin, Montana.

Draper, Charles H., B. S., 1912; Editor Carbon County Journal, Red Lodge, Montana.

Driscoll, William J., B. S., 1908; Civil Engineer, Lawrence, Mass.

Dusenbury, Inez, B. S., 1912; Bozeman, Montana.

Eberle, Alfred M., B. S., 1915; Farmer, Miles City, Montana.

Eckles, Mildred A., B. S., 1914; Instructor in Home Science, Thompson Falls, Montana.

Edsall, William, B. S., 1911; General Sales Manager, Westinghouse Electric Company, New York City.

Edwards, Margaret, B. S., 1912; Instructor in Home Science, High School, Jacksonville, Florida.

Edward, Timothy, B. S., 1909; Civil Engineer, Oro Fino, Idaho.

Ellis, Edward M., B. S., 1911; General Electric Company, Los Angeles, California.

Everett, Inez, B. S., 1914; Instructor in Home Science, Pine City High School, Pine City, Minnesota.

Fisher, Charles M., B. S., 1908; Electrical Engineer, Washington Water Power Company, Spokane, Washington.

Fisher, Helen, B. S., 1910; Mrs. Fred Willson, Bozeman, Montana.

Flager, Harold J., B. E. E. 1907; Statistician for Puget Sound Traction, Light and Power Company, Seattle, Washington.

Flager, Howard A., B. E. E., 1906; Business, Mount Vernon, Washington.

Flager, Ruth, B. S., 1910; Mrs. Carl Widener, Bozeman, Montana.

Flaherty, Charles D., B. C. E., 1904; Engineer, Cold Springs, Montana.

Fiske, John M., B. S., 1915; General Electric Company, Lynn, Massachussetts.

Fowler, Viola, B. S., 1915; Stenographer, Bozeman, Montana.

Flanders, Clara M., B. S., 1914; Mrs. William Vestal, Anaconda, Montana.

Foster, Florence, B. S., 1896; Mrs. Burton Fleming, Iowa City, Iowa.

Fox, Hazel, B. S., 1910; Mrs. Byram Mayfield, Enterprise, Oregon.

Freeman, Beatrice, B. S., 1900; Mrs. Thomas S. Davis, Columbus, Montana.

Freeman, W. B., B. C. E., 1903; In Charge of Irrigation and Drainage for the Government of Siam.

Froebe, Frank J., B. S., 1911; Montana Power Company, Helena, Montana.

Gardiner, Henry C., B. S. A., 1903; Veterinarian and Agriculturist, Anaconda Copper Mining Company, Anaconda, Montana.

Goodson, Anna, B. S., 1915; Teacher of Home Economics, High School, Anacortes, Washington.

Gordon, Fred E., B. S., 1913; Assistant Manager Land Department, Anaconda Copper Mining Company, Anaconda, Montana.

Gottschalck, Carl, B. S., 1909; M. S., 1910; Assistant in Chemistry, Montana State College, Bozeman, Montana.

Griffith, Warren J., B. E. E., 1907; Spokane, Washington.

Gray, Florence E., B. S., 1915; Teacher, Logan, Montana.

Gray, C. Wilson, B. S., 1915; Rancher, Great Falls, Montana.

Grimes, W. Walter, B. S., 1915; Assistant Engineer, A. C. M. Co., Anaconda, Montana.

Hagerman, Edna, B. S., 1912; Instructor in Home Science, Great Falls, Montana.

Haines, Will T., B. S., 1911; Instructor in Electrical Engineering, Montana State College, Bozeman, Montana.

Hansen, Charles L., B. S., 1914; Bozeman, Montana.

Ham, Frank W., B. S., 1903; M. S., 1905; Professor of Physics, Montana State College, Bozeman, Montana.

Hamilton, Everett A., B. S., 1911; Chief Operator Madison River Power Company, Norris, Montana.

Harmon, Ella M., B. S., 1914; Instructor in Home Science, Dawson County High School, Glendive, Montana.

Hartman, Brooke, B. S., 1913; Bookkeeper, Empire Bank and Trust Company, Lewistown, Montana.

Hartman, June, B. S., 1910; Instructor in Music, Montana State College, Bozeman, Montana.

Hartman, Lois K., B. S., 1907; Teacher, Balboa Heights, Panama, Central America.

Hartman, Ruth, B. S., 1913; La Barthe Pianoforte School, Chicago, Illinois.

Hartman, Will, B. S., 1908; Crookes and Hartman, Engineers, Livingston, Montana.

Hawkins, P. H., M. S., 1903; Banker, Absarokee, Montana.

Heighton, Pearl A., B. S., 1914; Instructor in Home Science, Gallatin County High School, Bozeman, Montana.

Henderson, Charles F., B. S., 1910; Westinghouse Electric Company, Pittsburg, Pennsylvania.

Henderson, Lisle, B. S., 1909; Electrical Engineer, Montana Reservoir and Irrigation Company, Helena, Montana.

Higgins, Lucille, B. S., 1911; M. S., 1912; Mrs. C. S. Norton, Jr., Bozeman, Montana.

Hill, Louis, L. S., 1914; Civil Engineer, Livingston, Montana.

Hind, Bert S., B. S., 1909;; Superintendent Power Plant, Madison River Power Company, Norris, Montana.

Hinman, Ruth, B. S., 1912; Teacher, Three Forks, Montana.

Hodgskiss, Wm. L., B. S., 1914; Manager of Ranch, Choteau, Montana.

Hodgskiss, John E., B. S., 1912; M. S., 1913; Farmer, Choteau, Montana.

Hollier, Georgia, B. S., 1915; Assistant Registrar's Office, Montana State College, Bozeman, Montana.

Hutton, Fred, B. E. E., 1902; Deceased.

Jacobs, Lillian, B. S., 1910; Mrs. Arie DeGroot, Three Forks, Montana.

James, John S., B. S., 1909; Engineer, Montana Reservoir and Irrigation Company, Cascade, Montana.

Jones, Burle J., B. S., 1904; Manager Orangewood Nursery Company, Phoenix, Arizona.

Jones, Ray S., B. S., 1915; Assistant Chemist, Experiment Station, Montana State College, Bozeman, Montana.

Jones, Wyatt Wagner, B. S., 1901; M. S., 1902; Plant Pathologist. Investigating Smelter Smoke, Salt Lake City, Utah.

Jones, Kyle, B. S., 1912; Assistant Cashier, First State Bank, Bynum, Montana.

Kenck, Max W., B. S., 1914; Homesteader, Silver Bow, Montana.

Kennedy, Cyril C., B. S., 1910; Power Plant Operator, Great Falls Power Company, Great Falls, Montana.

Kennard, Eveleen M., B. S., 1915; Mrs. Alfred Eberle, Miles City, Montana.

Kelly, Robert T., B. S., 1915; Draughtsman, Amalgamated Copper Company, Anaconda, Montana.

Kiefer, James A., B. S., 1914; Instructor in Physics, Montana State College, Bozeman, Montana.

Kimpton, Addie, B. S., 1910; Mrs. James H. Conrad, Toston, Montana.

King, Lowell, B. S., 1904; Construction Engineer, Electric Railroad, Davenport, Iowa.

King, Ruby E., B. S., 1909; Mrs. George Hogan, Bozeman, Montana.

King, Willard V., B. S., Entomological Assistant, United States Bureau of Entomology; Spotted Fever Tick Investigation, Florence, Montana.

Kinney, Edward C., B. C. E., 1907; Superintendent of Construction United States Indian Service, Ganado, Arizona.

Kirk, Grace, B. S., 1911; Instructor in Home Science, Bozeman Public Schools, Bozeman, Montana.

Kirk, Mary E., B. S., 1906; Mrs. Ermine Potter, Corvallis, Oregon.

Kirscher, W. Guy, B. S., 1909; County Surveyor, Broadwater County, Townsend, Montana.

Koch, Elers, B. S., 1901; Supervisor Forest Service, Missoula, Montana.

Kremer, William J., B. S., 1910; General Manager Pine View Irrigation Company, Ennis, Montana.

Lamme, Maurice A., B. S., 1903; Director of Geology and Mineralogy, Government University, Montevideo, Uruguay, S. A.

Lannin, Earl A., B. S., 1912; Electrical Engineer, Montana Power Company, Lewistown, Montana.

Leinard, Ford B., B. S., 1914; Homesteader, Edwards, Montana.

Lewis, Edna, B. S., 1903; Instructor in Mathematics Gallatin County High School, and Member of County Board of Examiners, Bozeman, Montana.

Livingston, Walter, B. S., 1910; Farmer, Livingston, Montana.

Lott, Mortimer, J., B. S., 1915; Rancher, Twin Bridges, Montana.

Locke, Jerome G., B. C. E., 1908; C. E., 1910; President and General Manager of the Livingston Publishing Company, Livingston, Montana.

Lorentz, Floyd S., B. E. E., 1907; E. E., 1910; Rancher, Coffee Creek, Montana.

Luther, J. Glenn, B. S., 1912; Electrical Engineer, Conrey Placer Mining Company, Ruby, Montana.

Mackay, Warren, B. S., 1913; Draughtsman, Anaconda Copper Mining Company, Anaconda, Montana.

Martin, C. A., B. S., 1914; Civil Engineer, Great Northern Railway, Havre, Montana.

Maynard, Edna, B. S., 1900; M. S., 1903; Mrs. Garfield T. Morris, San Francisco, California.

McCraw, John L., B. S., 1912; Deceased.

Metheney, Blanche, B. S., 1911; Demonstrator Montana Power Company, Billings, Montana.

Millegan, Guy J., B. S., 1912; Farmer and Stockgrower, Millegan, Montana.

Millegan, Homer D., B. S., 1914; Farmer and Stockgrower, Millegan, Montana.

Monforton, Zoe, B. S., 1901; Mrs. Dr. H. C. Patterson, National City, California.

Moore, Ellie J., B. S., 1901; Farmer and Insurance, Bozeman, Montana.

Morgan, George W., B. S., 1912; United States Experiment Farm, Havre, Montana.

Morgan, Joseph D., B. S., 1912; Assistant Grain Standardization Bureau, United States Department of Agriculture, New Orleans, La.

Malsor, Roy E., B. S., 1915; City Engineer's Office, Bozeman, Montana.

Myers, Ada Mae, B. S., 1915; Instructor in Home Science, High School, Billings, Montana.

Morgan, Carl F., B. S., 1915; Rancher, Joliet, Montana.

Morgan, Oliver P., B. S., 1896; Deceased.

Morris, Ellwood, B. S., 1909; Assistant Botanist and Bacteriologist, Montana Agricultural Experiment Station, Bozeman, Montana.

Morris, Garfield T., B. C. E., 1903; Senior Civil Engineer in the Valuation Department, Interstate Commerce Commission, Pacific Division, San Francisco, California.

Mountjoy, Agnes, B. S., 1907; Mrs. Harry Mickelson, Opheim, Montana.

Mountjoy, Irvin, B. E. E., 1908; Homesteader, Cardwell, Montana.

Nash, Lewis, B. S., 1904; Farmer, Clyde Park, Montana.

Noble, Erma, B. S., 1909; M. S., 1910; Teacher, Broadwater County High School, Townsend, Montana.

Noble, Edward G., B. S., 1915; Government Experiment Farm, Huntley, Montana.

Osborne, Belle, B. S., 1907; Mrs. D. E. Fish, Mount Pleasant, Iowa.

Papke, William C., B. S., 1915; Farmer, Bozeman, Montana.

Pettigrew, R. Leslie, B. S., 1915; United States Forest Produce Laboratory, Madison, Wisconsin.

Piedalue, Aimee M., B. S., 1915; Bozeman, Montana.

Pool, Florence E., B. S., 1915; Instructor in Home Science, High School, Havre, Montana.

Potter, John V., B. S., 1915; Westinghouse Electric Co., Pittsburg, Pennsylvania.

Pease, Jay L., B. C. E., 1907; Farmer, Bozeman, Montana.

Peck, Harry L., B. S., 1911; Garneill, Montana.

Penwell, Clyde C., B. S., 1906; B. E. E., 1907; Farmer, Belgrade, Montana.

Penwell, Clyde W., B. E. E., 1909; Montana Power Company, Great Falls, Montana.

Peters, Orville S., B. S., 1909; E. E., 1912; Assistant Physicist, Bureau of Standards, Washington, D. C.

Peterson, James A., B. S., 1909; Attorney at Law, St. Paul, Minnesota.

Philpott, June, B. S., 1911; M. S., 1912; Teacher Yamhill, Oregon.

Piedalue, Irene, B. S., 1911; Instructor in Home Science, Lewistown, Montana.

Piedalue, Laura, B. S., 1912; Instructor in Home Science, Helena High School, Helena, Montana.

Pool, Louis K., B. S., 1910; City Engineer, Townsend, Montana.

Potter, Ermine L., B. S., 1906; Professor Animal Husbandry, Oregon Agricultural College, Corvallis, Oregon.

Quaw, Eugene C., B. S., 1911; Playwright, Bozeman, Montana.

Quaw, Lucille, B. S., 1903; Teacher, Sedan, Montana.

Quaw, Mignon, B. S., 1902; Teacher, Butte High School, Butte, Montana.

Quaw, Thomas B., B. S., 1907; Mercantile Business, Bozeman, Montana.

Reese, Herbert J., B. S., 1904; Chemist, Long Beach, California.

Richter, Frederick A., B. S., 1914; With Madison Gas and Electric Company, Madison, Wisconsin.

Robinson, J. W., B. S., 1908; Grain Buyer for McCaull-Dinsmore Company, Bozeman, Montana.

Roecher, Rausie, B. S., 1914; Mrs. Selmer Solberg, Big Timber, Montana.

Sacket, Nathalie, B. S., 1913; Instructor in Whitehall High School, Whitehall, Montana.

Steele, W. Hamilton, B. S., 1915; General Electric Company, Pittsfield, Massachusetts.

Sacket, Charles T., B. C. E., 1904; C. E., 1907; Consulting Civil Engineer, Livingston, Montana.

Sales, Reno H., B. S., 1898; Geologist, Anaconda Copper Company, Butte, Montana.

Schabarker, W. W., B. M. E., 1902; Night Foreman, Shops, Milwaukee R. R., Milwaukee, Wisconsin.

Schmidt, F. W., B. S., 1903; Mining Engineer, Sao Paulo, Brazil, S. A.

Schumacher, F. W., B. S., 1914; United States Forestry Service, Anaconda, Montana.

Seamans, Arthur, B. S., 1913; United States Government Experiment Service, Huntley, Montana.

Shaw, W. T., B. S., 1896; Unknown.

Shovell, William L., B. S., 1912; Horticultural Expert, Bitter Root Irrigation Company, Hamilton, Montana.

Sloan, J. Harvey, B. C. E., 1903; Public Service Commission, Madison, Wisconsin.

Sloan, W. F., B. E. E., 1903; Consulting Engineer, Madison, Wisconsin.

Sloan, William Glenn., B. S., 1910; Government Drainage Engineer, Boise, Idaho.

Smith, Alda, B. S., 1913; Instructor in Home Economics, Montana State College, Bozeman, Montana.

Snider, Leta, B. S., 1911; Mrs. James A. Peterson, St. Paul, Minn.

Solberg, Selmer H., B. S., 1914; In Business, Big Timber Montana.

Soper, Joseph, B. S., 1913; Fruit Inspector, San Diego, California.

Spain, J. Marvin, B. S., 1911; Homesteader, Edwards, Montana.

Spain, Whitfield, B. S., 1909; Manager of ranch, Belgrade, Montana.

Spragg, Frank A., B. S. A., 1902; Plant Breeder of Farm Crops for the Michigan Experiment Station, Lansing, Michigan.

Stafford, Lucy B., B. S., 1896; Mrs. Wm. Peck, Pony, Montana.

Switzer, Phyllis Madge, B. S., 1914; Instructor in Home Science, Gallatin County High School, Bozeman, Montana.

Taylor, John C., B. S., 1912; County Agriculturist, Wibaux, Montana.

Tavener, Frank C., B. C. E., 1903; Consulting Engineer, Missoula, Montana.

Thompson, Homer C., B. S., 1902; Farmer, Three Forks, Montana.

Thorpe, Mabel A., B. S., 1907; Mrs. J. A. Thaler, Bozeman, Montana.

Thorpe, Elizabeth, B. S., 1907; Homesteader and Teacher, Salesville, Montana.

Tracy, Edna, B. S., 1908; Mrs. John White, Bozeman, Montana.

Tremper, William G., B. S., 1911; Homesteader, Baylor, Montana.

Truman, Joseph K., B. S., 1913; Operator, Hauser Lake, Montana.

Taylor, Emma L., B. S., 1915; Instructor in Home Science, Belgrade Schools, Belgrade, Montana.

Thompson, A. Paul, B. S., 1915; Research Department, Anaconda Copper Company, Anaconda, Montana.

Truitt, C. Alonzo, B. S., 1915; City Engineer's Office, Bozeman, Montana.

Vestal, William B., B. S., 1914; City Engineer, Anaconda, Montana.

Vreeland, Edna, B. S., 1909; Mrs. Robert K. Plues, Los Angeles, California.

Wade, Arthur M., B. S., 1911; Milwaukee Railroad, Three Forks, Montana.

Walchli, Fred, B. S., 1910; Mechanical Engineer, Kalispell, Montana.

Webster, Alden, B. S., 1914; Electrical Draftsman, Corps of Engineers, United States Army, Washington, D. C.

Widener, Carl C., B. S., 1908; City Engineer, Bozeman, Montana.

Wharton, John C., B. S., 1913; Stock Business, Wisdom, Montana.

Willey, Leroy, B. S., 1913; Dry Land Office, U. S. Department of Agriculture, Washington, D. C.

Williams, Frank B., B. M. E.; Engineer, State School for Deaf and Blind, Boulder, Montana.

Williams, Lee, B. E. E., 1902; County Surveyor, Powell County and City Engineer, Deer Lodge, Montana.

Williams, Roy B., B. S., 1911; Civil Engineer, Power, Montana.

Williams, Sidney A., B. S., 1911; Westinghouse Electric Company, Wilkinsburg, Pennsylvania.

Wilson, Elva, B. S., 1909; Teacher, Red Lodge, Montana.

Wilson, Walter, B. S., 1913; Westinghouse Electric Company, Pittsburg, Pennsylvania.

Wilson, Kathleen, B. S., 1915; Bozeman, Montana.

Wilcomb, Maxwell J., B. S., 1915; Twin Bridges, Montana.

Wolpert, Harold E., B. S., 1912; Working in Smelter, Mullen, Idaho.

Wylie, Lawrence, B. S., 1913; Electrification Department, C. M. & St. P. R. R., Butte, Montana.

Wylie, Mary, B. S., 1910; Bozeman, Montana.

SCHOOL OF MUSIC GRADUATES

Alexander, Maude, Piano, 1913, Student.....New York City
Alward, Coda, Piano, 1908.....Polson, Montana
Bancroft, Alma J., Piano, 1911, Mrs. Roy Strohm.....Bozeman, Montana
Benge, Faith, Piano, 1910, Mrs. Roy King.....Winterset, Iowa
Brown, Edith, Piano, 1906, Mrs. John Milloy.....Regina, Canada
Elliott, Mae, Piano, 1915.....Roundup, Montana
Featherston, Ellis, Piano, 1907, Music Teacher, Polytechnic.....Billings, Montana.
Freeman, Lorraine, Piano, 1906, Teacher.....Great Falls, Montana
Griffin, Grace, Piano, 1907, Mrs. W. C. Blythe.....Whittier, Calif.
Griffith, Gladys M., Piano, 1913, Student.....Minneapolis, Minn.
Hartman, Flora, Piano, 1907, Mrs. Roy Pinkerton.....Tacoma, Wash.
Hartman, June, Piano, 1910, Teacher, M. S. C.....Bozeman, Montana
Hartman, Ruth, Piano, 1913, Student.....Chicago, Illinois
Hartman, Leah, Piano, 1914, Teacher.....Bozeman, Montana
Hollier, Georgia, Piano, 1912.....Bozeman, Montana
Kirschner, Hortense, Piano, 1914, Student, M. S. C.....Bozeman, Montana
Lovelace, Amy, Vocal, 1908, Mrs. Geo. Rittenhouse.....Williams, Ariz.
Kammerer, Sophia, Piano, 1915, Teacher.....Bozeman, Montana
Maynard, Frances, Piano, 1909, Mrs. Ed. Howard.....Bozeman, Montana
Piedalue, Alice, Piano, 1908, Mrs. C. W. Hancock.....Lewistown, Montana
Stanton, Grace, Piano, 1901, Mrs. W. B. Walker.....Missoula, Montana
Sales, Zada, Piano, 1912, Student.....Chicago, Illinois
Schumacher, Hettie, Piano, 1912, Teacher.....Bozeman, Montana
Thorpe, Florence, Piano, 1914.....Bozeman, Montana
Waters, Mary, Piano, 1902, Mrs. H. L. Houston, Teacher.....Helena, Montana.
Widener, Carl, Vocal, 1908; City Engineer.....Bozeman, Montana
Work, Vida, Piano, 1909, Mrs. Ray Holloway.....Bozeman, Montana

Degrees Granted June, 1915

ELECTRICAL ENGINEER

Archibald S. Brown, Edward M. Ellis

BACHELOR OF SCIENCE

Tracy Hayes Abell	Horticulture
Alonzo David Burkett	Chemistry
Roland Brooks	Agronomy
Hazel C. Coffey	Home Economics
Lyndall Phillips Davidson	Chemistry
Alfred Max Eberle	Agronomy
John Manchester Fiske	Electrical Engineering
Viola Fowler	Secretarial Work
Anna Goodson	Home Economics
Florence E. Gray	Math-Physics
C. Wilson Gray	Animal Industry
W. Walter Grimes	Civil Engineering
Georgia Hollier	Secretarial Work
Ray S. Jones	Chemistry
Eveleen M. Kennard	Home Economics
Robert T. Kelly	Civil Engineering
Mortimer J. Lott	Animal Industry
Roy E. Malsor	Civil Engineering
Carl F. Morgan	Civil Engineering
Ada Mae Myers	Home Economics
Edward G. Noble	Animal Industry
William Carl Papke	Civil Engineering
Robert Leslie Pettigrew	Civil Engineering
Aimee Marie Piedalue	Secretarial Work
Florence E. Pool	Home Economics
John Vermilye Potter	Electrical Engineering
W. Hamilton Steel	Electrical Engineering
Emma Louise Taylor	Home Economics
A. Paul Thompson	Chemistry
C. Alonzo Truitt	Civil Engineering
Kathleen Wilson	Home Economics
Maxwell Jeffres Wilcomb	Civil Engineering

MUSIC

Diploma

Mae A. Elliott	Clara, Mont.
Sophia K. Kammerer	Bozeman, Mont.

Names of Students, 1915-16

POST GRADUATE

Bennion, Fred	Animal Industry	Bozeman
Burket, Alonzo D.	Chemistry	Bozeman
Dearborn, C. S.	Mathematics	Bozeman
Gieseker, L. F.	Mathematics	Bozeman
Hytree, E. C.	Physics	Bozeman
Jones, Ray S.	Physics	Bozeman
Kiefer, James	Mathematics	Bozeman
Smith, G. E.	Mathematics	Bozeman
Wells, Roscoe	Biology	Bozeman

SENIORS

Allen, Mollie	Home Economics	Butte
Batch, Otto	Animal Industry	Helena
Borthwick, Alberta	Home Economics	Hamar, N. Dak
Border, Ernest	Animal Industry	Bozeman
Chestnut, Lula	Home Economics	Havre
Cooley, Esther Belle	Home Economics	Bozeman
Cotner, Victor	Civil Engineering	Billings
Clarkson, Robert	Animal Industry	Chinook
Carr, M. L.	Animal Industry	Bozeman
Dahl, Hilmer	Mechanical Engineering	Belt
Ford, Arthur	Mechanical Engineering	Helena
Fletcher, M. Elizabeth	Home Economics	Bozeman
Homann, Fred C.	Mechanical Engineering	Bozeman
Heageney, Wm. F.	Agronomy	Bozeman
Jackson, Joel	Agronomy	Harrison
Jacobs, Edward	Electrical Engineering	Delta, Colo.
Kelly, Jeanette	Home Economics	Deer Lodge
Kinsella, Olive	Home Economics	Bozeman
Kelly, Martin	Civil Engineering	Anaconda
Kessel, Erma	Chemistry	Butte
Kescher, Taylor	Electrical Engineering	Great Falls
McCormick, C. C.	Agronomy	Beaver, Pa.
Niewald, Ethel	Home Economics	Chinook
Nilburn, George R.	Civil Engineering	Butte
Noxley, Edith	Secretarial	Eugene, Ore.
Nordquist, Clark	Agronomy	Bozeman
O'Connor, William	Animal Industry	Red Lodge
Osenburg, Albert	Agronomy	Butte
Riddell, Mary	Home Economics	Helena
Romney, G. O.	Agronomy	Salt Lake City, Utah
Smith, Inez	Home Economics	Bozeman

Seamans, Howard L.	Zoology-Entomology,	Wauwatosa, Wis.
Steel, David	Civil Engineering	Great Falls
Stanley, Amelia	Home Economics	Great Falls
Sweat, Ruth	Home Economics	Great Falls
Stadler, Marie	Chemistry	Helena
Walker, Cecil	Home Economics	Bozeman
Whipple, Charles	Animal Industry	Helena

JUNIORS

Bullock, Fred	Agronomy	Bozeman
Beerstecher, Ada	Home Economics	Belgrade
Cannon, Raymond	Animal Industry	Bozeman
Cole, E. Lester	Agronomy	Butte
Cook, Donald	Chemistry	White Sulphur Springs
Cooley, George A.	Animal Industry	Bozeman
Christensen, Anker L.	Mech. Engineering	Lancaster, Wash.
Crittenden, Floyd	Agriculture	Bozeman
Cook, Chas. W.	Civil Engineering	Roundup
Decamp, Renan	Electrical Engineering	Helena
Duquette, Jay	Electrical Engineering	Potomac
Fox, Arthur	Agronomy	Kalispell
Fowler, Edith	Home Economics	Great Falls
Gatton, C. J.	Animal Industry	Bozeman
Garvin, John P.	Elec. Engineering	Osakis, Minn
Hodgskiss, Ursula	Home Economics	Choteau
Hansen, Waldemar	Agricultural Chem.	Whitewood, S. D
Ingram, Craig	Electrical Engineering	Helena
Jorgenson, Ralph	Animal Industry	Fo:
Jaeckel, Carl O.	Agronomy	Anaconda
Kountz, Josephine	Home Economics	Bozeman
Kretlow, Mary	Home Economics	Helen:
Kneale, Morris T.	Civil Engineering	Bergen, N. Y
Ladenburg, Carl E.	Elec. Engineering	Columbia Fall
Lund, Janelle	Chemistry	Three Fork:
Luther, Edith	Chemistry	Chotea
Linfield, Bertil	Agronomy	Bozema
Langohr, Don	Botany and Bacteriology,	Bozema
Milnor, Estella	Industrial Chemistry	Tro
Manning, J. M. W.	Animal Industry	Great Fal
Mitchell, Ruth	Secretarial	Bozema
Merigold, March	Applied Art	Kalispe
Monson, William	Civil Engineering	Ovand
McIver, Grace	Secretarial	Great Fal
McSpadden, F. E.	Agronomy	Missou
Noble, Ruth A.	Secretarial	Great Fal
Rapatz, Eugene	Electrical Engineering	Hav

Ronne, Edwin M.	Electrical Engineering	Chinook
Rice, Hubert	Animal Industry	Kalispell
Reddick, Theo.	Zoology-Entomology, Hermosa, S. Dak.	
Sherry, C. B.	Agronomy	Camas
Scott, Parke F.	Agriculture	Armstead
Saltz, Lawrence	Chemistry	Dundee, Mich.
Sutherland, Edward	Civil Engineering	Bozeman
Scholten, Henry	Mechanical Engineering	Big Timber
Strand, Roy	Zoology and Entomology	Helena
Stewart, Mildred	Chemistry	Bozeman
Snow, M. L.	Agronomy	Marion, Ohio
Stahlford, Ruby	Home Economics	Hamilton
Truman, Ida	Home Economics	Bozeman
Thomas, David S.	Civil Engineering	Great Falls
Tubbs, Palmer	Civil Engineering	Elkhorn Wis.
Taylor, Radford	Animal Industry	Bozeman
Undem, Louis	Animal Industry	Chicago, Ill.
Wilcox, Guy	Secretarial	Dupuyer
Whiteside, John	Electrical Engineering	Kalispell
Young, Mrs. Verna	Home Economics	Butte

SOPHOMORES

Armstrong, Nina	Secretarial	Big Timber
Arneson, Hattie	Secretarial	Big Timber
Arneson, Elmer	Agriculture	Big Timber
Abrahamson, Irene	Home Economics	Red Lodge
Bowlen, Wayne	Mechanical Engineering	Red Lodge
Borton, Albert	Agriculture	Glasgow
Borton, Blanche	Home Economics	Bozeman
Borton, Carl	Civil Engineering	Glasgow
Burke, John	Electrical Engineering	Butte
Babbitt, Minnie	Home Economics	Victor
Collett, John	Applied Art	Livingston
Cannon, Vera	Secretarial	Bozeman
Cannon, Marjorie	Secretarial	Bozeman
Collins, Kins	Secretarial	Dillon
Carson, Simeon	Electrical Engineering	Boulder
Corkins, Clafford	Agriculture	Joliet
Danielson, Mary	Zoology and Entomology	Miles City
Drummond, Warren	Mechanical Engineering, East Helena	
Dickson, Harold	Agriculture	Bozeman
Emhoff, Elizabeth	Home Economics	Stevensville
Ford, Albert	Mechanical Engineering	Bozeman
Finley, Will	Agriculture	Bozeman
Flood, Marie	Home Economics	Park City
Glass, E. R.	Electrical Engineering, Waverly, Kan.	

Gatton, Walter	Zoology and Entomology	Bozeman
Gray, Helen	Home Economics	Bozeman
Hagen, Roy C.	Electrical Engineering	Great Falls
Hoem, Arthur	Mechanical Engineering	Butte
Helstrom, Carl	Civil Engineering	Anaconda
Holt, Clarence	Agriculture	Stevensville
Hastings, John	Electrical Engineering	Joliet
Haller, Beulah	Home Economics	Butte
Hall, Medra	Home Economics	Bozeman
Hodskiss, Ruby	Home Economics	Choteau
Johnson, Martha	Home Economics	Clancy
Johnson, Arne G.	Agriculture	Butte
Jolley, Lewis	Architectural Engineering	Bozeman
Kelly, Jean D.	Agriculture	Anacando
Kuhsn, Raymond	Civil Engineering	Kalispell
King, Kenneth M.	Zoology and Entomology	Whitehall
Kuhns, Myrtle	Home Economics	Kalispell
Kirschner, Hortense	Home Economics	Bozeman
Luce, Llewellyn	Secretarial	Bozeman
Lund, Helen	Applied Art	Three Forks
Langohr, Louise	Home Economics	Bozeman
Mudd, O. C.	Electrical Engineering	Fishtrap
McCabe, John	Electrical Engineering	Kalispell
Minar, John W.	Agriculture	Fort Benton
McCone, Alice	Home Economics	Glendive
Nye, Paul	Agriculture	Billings
Noble, Florence	Applied Art	Bozeman
O'Connor, Frank	Agriculture	Red Lodge
Park, Lee	Secretarial	Bozeman
Pippenger, Harold F.	Electrical Engineering	Glasgow
Preston, Edward	Electrical Engineering	Stevensville
Pope, Alger	Mechanical Engineering	Bozeman
Quaw, Marjorie	Applied Art	Bozeman
Roberts, Otto	Agriculture	Salesville
Rothwell, Howe	Civil Engineering	Columbus
Riddick, Rolland C.	Agriculture	Lewistown
Ritz, Gladys	Chemistry	Anaconda
Ribelin, Carter G.	Electrical Engineering	Polson
Robinson, Ernest G.	Zoology and Entomology	Moore
Ross, Thomas A.	Agriculture	Ada
Rowe, Mary	Secretarial	Victor
Stranahan, Clinton	Agriculture	Fort Benton
Sewell, Gordon	Chemistry	Anaconda
Scott, Samuel	Mechanical Engineering	Butte
Street, Rupert	Agriculture	Helena
Swan, Ulmont	Mechanical Engineering	Butte

Sweat, Jack	Agriculture	Great Falls
Thien, Edmund J.	Electrical Engineering	Ryegate
Todd, Wallace	Secretarial	Sedro Wooley, Wash.
Watters, Lawrence B.	Agriculture	Victor
Woolridge, Francis	Agriculture	Chinook
Weere, Harold	Zoology and Entomology	Bozeman
Wallace, Fred	Secretarial	Bozeman
Walker, J. Paul	Agriculture	Bozeman
Ziebarth, Dorothy	Secretarial	Chinook

FRESHMEN

Anderson, Bernard	Agriculture	Valier
Axtell, Lucy	Applied Art	Bozeman
Burgess, Ralph	Agriculture	Helena
Berg, Sigvald	Agriculture	Helena
Bergman, Clarence	Agriculture	Manhattan
Bean, Willard	Mech. Engineering	Billings
Boberg, Washington	Agriculture	Sandy, Utah
Beatty, Lura	Home Economics	Bozeman
Bartz, Mildred	Applied Art	Bozeman
Benepe, L. L.	Agriculture	Bozeman
Baker, Ada	Secretarial	Plains
Beardsley, C. Ford	Electrical Engineering	Boulder
Bunnell, Marie	Home Economics	Bozeman
Confarr, Gene	Electrical Engineering	Livingston
Chamberlain, Elsie	Home Economics	Stockton, Kan.
Crook, Efton	Civil Engineering	Lewistown
Chattin, Lynnie	Home Economics	Big Timber
Conway, Mary	Chemistry	Billings
Calkins, Walter	Electrical Engineering	Butte
Callaghan, Lawrence	Architectural Engineering	Bozeman
Conroy, Vera	Secretarial	Bozeman
Chattin, Earl	Agriculture	Big Timber
Carmichael, Mabel	Home Economics	Butte
Cravath, Marjorie	Home Economics	Sidney
Cornish, Vivian	Secretarial	Livingston
Duncan, Hazel	Applied Art	Bozeman
Dull, Ira	Electrical Engineering	Miles City
Daniells, Helen	Applied Art	Deer Lodge
Davidson, Paul	Industrial Chemistry	Bozeman
Davis, Russell L.	Agriculture	Lo Lo
Denny, Ethel L.	Home Economics	Rupert, Idaho
Dundas, Marion	Secretarial	Bozeman
Ford, Harold	Electrical Engineering	Butte
Fitzgerald, James	Mechanical Engineering	Bozeman
Flint, Nelson	Mechanical Engineering	Bozeman

Galbraith, Lewis	Industrial Chemistry	Bozeman
Graves, Nelson F.	Agriculture	Whitehall
Gray, David	Industrial Chemistry	Choteau
Gray, Robertz	Agriculture	Bozeman
Gutelius, R. S.	Civil Engineering	Anaconda
Haynes, Etta	Home Economics	Boulder
Herron, Miriam	Home Economics	Bozeman
Hamilton, George	Agriculture	Murray, Utah
Humphrey, Leo C.	Chemistry	Holyoke, Mass.
Hayes, Lawrence	Electrical Engineering	Butte
Hannah, John M.	Civil Engineering	Billings
Hogeland, Frank	Electrical Engineering	Lewistown
Howard, Courtland	Zoology and Entomology	Bozeman
Ingram, Doris	Home Economics	Helena
Jacoby, George	Architectural Engineering	Helena
Kingsbury, Louise	Secretarial	Valier
Knott, Georgia F.	Home Economics	Heron
Lehfeldt, Hedwig	Secretarial	Broadview
Limbert, Emmet	Agriculture	Two Dot
Linfield, Azalea	Home Economics	Bozeman
Lorentz, Henry	Electrical Engineering	Toston
Leckliter, Gladys M.	Applied Art	Salesville
Mashin, Ladimir	Agriculture	Chicago, Ill.
Murphy, Inez	Secretarial	Polson
Marchion, Elmo	Mechanical Engineering	Anaconda
Monforton, Lucille	Home Economics	Bozeman
McDonald Wallace	Architectural Engineering	Bozeman
Morphy, Lloyd A.	Elec. Engineering	Junction, Idaho
MacVey, Chester	Elec. Engineering	Stevensville
Muntzer, Henry	Elec. Engineering	Butte
McElwee, James	Elec. Engineering	Bozeman
McMahon, Abe	Mechanical Engineering	Glasgow
Mathews, Grace	Chemistry	Roundup
Moe, Fred W.	Agriculture	Deer Lodge
MacMillan, Gregor	Electrical Engineering	Butte
Mabee, Will B.	Agriculture	Glasgow
Major, Glenn	Civil Engineering	Helena
Mills, Dorothy	Home Economics	Helena
Murray, Henry	Agriculture	Hobson
McMillan, Ina	Home Economics	Glengarry
Mertz, Adele	Home Economics	Butte
McDonald, Ronald	Electrical Engineering	Whitehall
Norcutt, Etta	Home Economics	Denton
Nelson, Curtis	Zoology and Entomology	Havre
Nicholson, Gladys	Secretarial	McLeod
Norris, Earl	Agriculture	Helena
Noble, Daniel B.	Agriculture	Whitehall

Prentiss, Earle	Electrical Engineering	Hamilton
Paul, Gladys	Secretarial	White Sulphur Springs
Parker, Helen Lucyle	Home Economics	Helena
Rinehart, Lewis	Zoology and Entomology	Billings
Rowe, Forrest	Agriculture	Pasedena, Cal.
Reitz, Harold	Electrical Engineering	Terry
Robinson, Ernest C.	Agriculture	Lewistown
Roecher, Chester	Zoology and Entomology	B zeman
Smith, Robert B.	Zoology and Entomology	Billings
Simes, Ella	Secretarial	Great Falls
Schrammeck, Clifford	Agriculture	Bozeman
Smith, Ruth	Secretarial	Salina, Kans.
Stewart, Hal	Secretarial	Bozeman
Stone, Louise	Home Economics	Bozeman
Solberg, Stella	Home Economics	Big Timber
Smith, Lois	Home Economics	Salina, Kans.
Sexton, Opal	Home Economics	Moore
Senz, Melvin J.	Electrical Engineering	Terry
Shipps, Marie	Home Economics	Bozeman
Stephenson, Harley	Mechanical Engineering	Belgrade
Stanley, Ernest B.	Agriculture	Whitehall
Smith, Stephen E.	Agriculture	Billings
Stone, A Parker	Agriculture	Bozeman
Sappington, Harold	Agriculture	Sappington
Schock, Dorothy	Home Economics	Billings
Seely, Evelyn	Secretarial	Bozeman
Taylor, Horace D.	Agriculture	Bozeman
Trask, G. Preston	Agriculture	Ballantine
Taylor, Homer	Agriculture	Clear Lake, Wash.
Templeton, Russell	Chemical Engineering	Anaconda
Wilson, Fred B.	Secretarial	Victor
Westlake, Lovitt	Chemistry	Bozeman
Wheeler, Mark	Agriculture	Gildford
Waterman, Marie	Home Economics	Bozeman
Warr, Chester	Agriculture	Hawarden

IRREGULAR.

Brown, Mrs. Fred	Bozeman
Davis, Homer I	Dickinson, N. D.
Holst, J. H.	Bozeman
McKinney, Eva	Bozeman
Peters, George F.	Hamburg, Germany
R. G. Richardson	Salt Lake City, Utah

Secondary Students

FOURTH YEAR

Badgley, Jerome	Mechanic Arts	Bozeman
Beach, Ben	Mechanic Arts	Mitchell
Cravath, Florence	Home Economics	Sidney
Lindsey, Lyle	Mechanic Arts	Hobson
Lehfeldt, Martha	Home Economics	Broadview
Murray, Joe	Mechanic Arts	Hobson
Roubidoux, Llewellyn	Mechanic Arts	Fort Hall, Idaho
Sandberg, Harold	Mechanic Arts	Collins
Woodward, Otto.	Mechanic Arts	Willow Creek

THIRD YEAR

Axtell, Lillian	Home Economics	Bozeman
Burns, James P.	Mechanic Arts	Ashland
Berry, Robert A.	Mechanic Arts	Basin
Farnum, Ernest	Mechanic Arts	Harlem
Jenkins, Fred	Mechanic Arts	Twin Bridges
Kendall, Charlotte	Home Economics	Grass Range
Kingsbury, Lelia S.	Home Economics	Valier
Kinmouth, Maurine	Home Economics	Ballantine
Lorentz, Lyndon	Mechanic Arts	Toston
Ravet, John	Mechanic Arts	Bozeman
Reynolds, Roy E.	Mechanic Arts	Broadview
Sparrow, Mary	Home Economics	Alder
Stedman, Gladys	Home Economics	Armells
Schekenbach, Frank	Mechanic Arts	Manhattan
Young, Beatrice	Home Economics	Columbus

SECOND YEAR

Banks, Louis	Mechanic Arts	Butte
Curl, Mary M.	Home Economics	Gardiner
Ditty, Ethel	Home Economics	Lewistown
Gilman, Vergle	Mechanic Arts	Bozeman
Halstead, Beebe	Mechanic Arts	Ashland
Hoyem, George A.	Mechanic Arts	Lennep
Johnson, Jessie	Home Economics	Belt
Kennedy, John	Mechanic Arts	Jefferson Island
McKee, Archie	Mechanic Arts	Bozeman
Mengelkoch, Wesley	Mechanic Arts	Norris
Norton, Elmer	Mechanic Arts	Drummond
Ohlin, Enoch	Mechanic Arts	Huntley
Omta, Anna	Home Economics	Bozeman
Reese, Marguerite	Home Economics	Bozeman
Reel, Cecil	Mechanic Arts	Norris

FIRST YEAR

Allen, Laura V.	Home Economics	Livingston
Ames, Irving	Mechanis Arts	Alhambra
Bates, Pearl	Home Economics	Dixon
Campbell, Leslie	Mechanic Arts	Reed Point
Craig, Paul	Mechanic Arts	Bozeman
Charters, Naomi L.	Home Economics	Grass Range
Gee, Hugo L.	Mechanic Arts	Belgrade
Gerber, Lillian	Home Economics	Sand Coulee
Hereim, Elida	Home Economics	Lennep
Hill, Grace F.	Home Economics	Yellowstone Park
Jackson, Clarence	Mechanic Arts	Bozeman
Kluss, Gilbert	Mechanic Arts	Philipsburg
Kirby, Etta E.	Home Economics	Gebo, Wyo.
Lacher, Opal	Home Economics	Kalispell
Lindsley, Marguerite	Home Economics,	Ft. Yellowstone
Miller, Eva	Home Economics	Toston
Morris, Abraham	Mechanic Arts	Belt
Roark, Flora	Home Economics	Manhattan
William, Horace	Mechanic Arts	Anaconda
Walton, Linn	Mechanic Arts	Belgrade

School of Agriculture

POST GRADUATE

Dehler, August	Helena

THIRD YEAR

Benson, Albert	Stevensville
Blickensderfer, John	Wills, N. D.
Beldon, Harold	Utica
Carpenter, Chester	C'yde Park
Campbell, Fred	Cheyenne Agency, S. D.
Hodgson, William H.	Kalispell
Kennedy, Jesse	Harlem
Lull, John	Summit, S. D.
Maier, R. A.	Reichle
Martin, Donald	Spencer, Iowa
Rowland, Arthur S.	Bynum
Starz, Oscar	Helena
Sullivan, Frank	Stevensville
Tow, Clarence	Box Elder
Tow, Raymond	Box Elder
Van Essen, Cornelius	Stevensville
Ward, Earl	Salesville
Wohlfrom, Burdette	Canyon Creek

SECOND YEAR

Bokma, Peter	Conrad
Bernstein, Maurice	Chicago, Ill.
Budde, Herman	Great Falls
Budd, Fred	Whitehall
Brady, Milton	Bozeman
Cockrell, B. R.	San Jose, Cal.
Edwards, George	Monarch
Eberle, John	Clemons
Grimes, T. W.	Helena
Hasbrouch, E. D.	Sheridan, Wyo.
Heare, Olga	Red Lodge
Hilditch, Edwin	Scranton, Pa.
LaChapelle, Ulric	Hogan
Lea, Wesley	Stevensville
Lombard, Charles	Missoula
McTucker, Nat	Dixon
McSweyn, Allen	Birney
McNeil, Lester H.	Decker
Metzel, Alexander	Ruby
Murdoch, Wallace	Sun River
Martinell, Ray	Dell
Nelson, Charles	Lewistown
Prescott, Allen	Helena
Peterson, Andrew	Springdale, Idaho
Pickle, Fred	Powell, Wyo.
Redfield, James T.	Bozeman
Reed, Robert	Winnham
Russell, Charles	Luther
Steves, Walter	Livingston
Shreve, Bennie	Decker
Studebaker, Floyd R.	Broadview
Taylor, Leland	Hamilton
Woodley, Francis	Scobey
Wheeler, Hobart	Froid
Williams, Earl	Jackson, Mo.

FIRST YEAR

Albright, Henry	Virginia City
Arkwright, Harwood	Miles City
Allen, Frank	Utica
Akerly, Stewart	Coffee Creek
Burke, W. E.	Bozeman
Black, Irwin	Norris
Brainard, Harry	Maudlow
Bissonett, Howard	Gold Creek

Conant, Chris	Judith Gap
Charters, Forest	Grass Range
Coburn, Alex H.	Enid
Carlson, Charles	Basin
Dillman, Ferry	Conrad
Dunning, Sydney	Ashland
Gordon, Harold	Jens
Gruar, John	Sixteen
Harper, Howard	Chicago, Ill
Harrington, L. Roy	Harlowton
Hogan, Emmet	Billings
Johnson, Sidney	Highwood
Jackson, Frank	Jeffers
Johnson, Lee	Belt
Knowles, R. C.	Chico Hot Springs
Kieckbusch, Willie	Townsend
Keester, Harry	Highwood
Knoke, Eugene	Glaston
Liedtke, J. M.	Worden
Lathom, Earl	Columbus
Madson, George A.	Absarokee
McLeod, W. W.	Bozeman
Moore, Roy	Dutton
Murray, R. L.	Hobson
Nordstrom, Victor	Helena
Norman, Hugo	Belgrade
Powell, Charlie	Victor
Powell, Ralph	Victor
Paugh, Robert	Jeffers
Paugh, John	Jeffers
Redfield, Ralph	Bozeman
Ryan, William M.	Sweet Grass
Randolph, Dewey	Grass Range
Roberts, W. H.	Harlem
Snyder, Wesley	Glaston
Sheard, Harold	Livingston
Shriver, Alvin	Shriver
Taylor, Raymond	Cascade
Trusler Roy	Ashland
Thompson, Sam	Decker
Vander Ende, T. E.	Manhattan
Wills, Nat	Red Lodge
Yust, E. B.	Kremmling, Colo

School of Mechanic Arts

THIRD YEAR

Hulton, David Bridger

FIRST YEAR

Clapp, Adelbert Lavina
McKnight, Walter Townsend
Oswald, Fay Lake, Idaho
Rhone, Frank Camas
Shelhammer, Lloyd Clyde Park
Sh-rlock, Wigmore Toston
Tribble, Martin Belgrade

School of Home Economics

THIRD YEAR

Sheldon, Helen Belt

FIRST YEAR

Brogelman, Henrietta Hardin
Beehrer, Kate Reichle
Burkman, Edith Idaho Falls, Idaho
Coppock, Erma Buffalo
Gee, Edith Belgrade
Payne, Elsie Kimball
Robberson, Jessie Bozeman
Redfield, Alta Twin Bridges
Tieden, Anna Elkader, Iowa

Traction and Stationary Engine License Course

SECOND YEAR

Tronson, Harry Great Falls

SECOND YEAR

Babbitt, Everett Victor
Burditt, Fred Victor
Baumgartner, Arthur Stickley
Cleveland, Kyle Ekalaka
Graeber, Esgar Winifred
Hastings Ralph Great Falls
Hicks, Theron Harlowton
Hicks, Theron Harowton
Kramer, Clyde Springhill
Plumlee, Isaac Duquin, Ill.
Ross, Charley Townsend
Stiff, Lloyd Belgrade
Switzer, Lester Jeffers

Summer Session 1915

Allen, Mollie Butte
Abell, Tracy Bozeman
Alexander, B. H. Willow Creek
Bennion, Fred Bozeman
Bressler, Ruby Bozeman
Booth, Sophia Bozeman
Boss, Lulu Belgrade
Brady, Estella Bozeman
Bennett, Donald Belgrade
Barclay, Pauline Bozeman
Boyle, Margaret Butte
Boyle, S. E. Butte
Brome, Frances E. Butte
Coffey, Hazel C. Bozeman
Curtis, Elizabeth S. Butte
Courtenay, Pansy Miles City
Cooper, Covie Bozeman
Clark, Effie Bozeman
Dahlquist, Selma E. Barr
Dahlquist, Ebba Barr
Downey, Eugenia Bozeman
Doerflinger, Lillie Lewistown
Elsom, Mary Bozeman
Fischer, Susie E. Hamilton
Fawcett, Mark Sidney
Fawcett, Belle Sidney
Friess, Floy Olds Butte
Friess, Scott Butte
Flint, Nelson J. Bozeman
Gallagher, Grace Hysham
Gray, Florence Bozeman
Gerber, Elsie Sand Coulee
Gatton, Florence Bozeman
Gallagher, Mary Hysham
Gordon, Ruth Belgrade
Gibson, Frances Belgrade
Grobe, Nellie Willow Creek
Gibson, Earl Bozeman
Grycmacher, Mrs. D. M. Bozeman
Hall, M. Bessie Davenport, Ia.
Harmon, Cora A. Bozeman
Hedrick, Charlotte Bozeman
Hytree, E. C. Bozeman
Hyatt, Joseph Bozeman
Hull, Viola Bozeman

Hartman, Lucille.....Butte
Hodel, Alma.....Hysham
Hodel, Elma.....Hysham
Ice, Laura.....Gifford, Ill.
Jennison, H. M.....Bozeman
Jenkins, Cora D.....Butte
Jollife, E.....Bozeman
Kirsch, Rosa.....Agawam
Kirk, Marguerite.....Bozeman
Kirk, Eleanor L.....Bozeman
Kellams, Pearl.....Medicine Lake
Kirk, Grace.....Bozeman
Lyman, Helena.....Bozeman
Lyon, Vivian V.....Wilsall
LaBonte, Walter.....Bozeman
La Bonte, Fred.....Bozeman
Lee, Minnie.....Bozeman
Moore, Katherine.....Lewistown
McCormick, C. C.....Colfax, Wash.
Mayer, Florence M.....East Helena
Matthews, Dorothy.....Bozeman
Moore, Mary.....Lewistown
Marble, Cordelia.....Bozeman
Matthew, Edna.....Bozeman
Marley, Teresa.....Bozeman
McRoberts, Edith.....Bozeman
McRoberts, Jennie.....Bozeman
Mack, Hazel.....Cardwell
McIntosh, Ruth.....Bozeman
Mallery, A. L.....Sage
Malvern, Edith.....Watkins
Malvern, Gladys.....Watkins
Martin, Pauline.....Bozeman
Martinsdale, Irma.....Red Lodge
McMurty, Pearl.....Salesville
Nickel, Anna E.....Butte
Nauman, Maude.....Bozeman
Overgaard, Knute.....Hysham
O'Neill, Katherine.....Butte
Olson, Mrs. M. M.....Medicine Lake
O'Loughlin, R. J.....Terry
Orth, Frances.....Bozeman
Peterson, Mrs. J. M.....Bloomfield
Peterson, J. M.....Bloomfield
Pratton, Mame.....Fishtail
Post, Clara M.....Belgrade
Piedalue, Aimee.....Bozeman

Rosean, Florence.....Columbus
Rider, Helen.....Bozeman
Russell, Ethel.....Bozeman
Rickey, Minnie.....Brockway
Robinson, Jenny.....Butte
Stadler, Marie H.....Helena
Seeley, Florence.....Bozeman
Seeley, Ethel.....Bozeman
Stiff, Gertrude.....Bozeman
Sexton, Opal.....Moore
Sharpe, Marie.....Moore
Stumpf, Bruno.....Bozeman
Swope, Ammon.....Boulder
Stevens, Bessie.....Bozeman
Streets, Rupert.....Helena
Satterfield, Chas. D.....Cape Girardeau, Mo.
Schulten, Theresa.....East Helena
Street, Grace.....Bozeman
Sheperd, Mrs. Ester.....Bozeman
Singleton, Ethel.....Antelope
Sheldon, Edna M.....Clyde Park
Thompson, Leta M.....Clyde Park
Tallman, Pearle.....Des Moines, Ia.
Thorpe, Elizabeth.....Salesville
Watson, L. A.....Hysham
Williams, Eva.....Butte
Ward, Minnie.....Trident
Woodward, Nina.....Willow Creek
Wolfgram, Duwane.....Bozeman
Williamson, J. D.....Bozeman
Wheeler, Jessie M.....Glasgow
Watson, Edith.....Big Sandy
Young, Verna T.....Victor
Young, Margaret.....Three Forks

Ministers' Week

Billingsley, J. A.....Butte
Colton, O. C.....Bozeman
Cheesman, J. F.....Manhattan
Currens, J. B.....Pocatello, Idaho
Cameron, Robert A.....Anaconda
Clark, L. G.....Helena
Cress, G. Clifford.....Lewistown
Cunningham, Charles E.....Livingston
Chapman, A. L.....Bozeman
Divine, S. L.....Bozeman
Duven, William.....Manhattan

Entorf, L. F. Cleveland
Ferris, J. T. Corvallis
Gold, James D. Browning
Gault, Frank M. Gardiner
Hess, F. O. Manhattan
Hoffman, J. A. Terry
Hamilton, Argus Bozeman
Johnson, H. O. Huntley
Lacklen, Jesse Bozeman
Marshall, W. H. L. Columbus
Morris, J. D. New York
Newman, Robert W. Missoula
Parker, J. E. Helena
Powell, G. J. Billings
Ross, John G. Butte
Ratch, Paul E. Belgrade
Ross, W. A. Hysham
Sloan, W. N. Helena
Swisher, E. D. McAllister
Smith, Edward Helena
Thomas, George W. Three Forks
Titus, D. B. Kalispell
Turner, Horace Lavina
Valiant, E. A. Bozeman
Walker, Raymond B. Wibaux
Wallace, F. W. Billings
Wilson, Warren H. New York
White, George A. Polson
Whitely, John M. Huntley
Wolfe, George D. Butte

Farmers' and Homemakers' Short Courses

Alderson, Mrs. M. W. Helena
Alderson, Frank Bozeman
Aitken, Mrs. Walter Bozeman
Allphin, Fred Wilsall
Alward, Coda M. Polson
Arneson, A. H. Big Timber
Arthur, William S. Williston, N. Dak.
Ashley, J. Newton Corvallis
Asher, Mrs. James Bozeman
Bennett, F. A. Great Falls
Buell, Mrs. H. S. Bozeman
Bailey, Seavey M. Florence
Bohart, W. O. Bozeman
Brown, Grover G. Bozeman

Blair, Harvey.....Kalispell
Benjamin, F. H.....Bozeman
Berg, Mrs. Andrew.....Lennep
Budd, H. O.....Whitehall
Benepe, Mrs. Doremus.....Bozeman
Berg, Andrew.....Lennep
Brownell, W. I.....Belgrade
Boddy, G. F.....Bozeman
Cravath, Fred J.....Lambert
Banker, Paul P.....Havre
Benjamin, G. A.....Fort Shaw
Buttleman, William H.....Willow Creek
Buttleman, William, Jr.....Willow Creek
Brainard, W. D.....Maudlow
Butler, Floyd E.....Salesville
Blake, Gertrude.....Billings
Blake, Donald P.....Billings
Bogue, Mrs. R. H.....Bozeman
Blanchard, R. A.....Great Falls
Burke, Mrs. W. E.....Bozeman
Brooks, Arthur L.....Bozeman
Bailey, Mrs. S. M.....Florence
Bartlett, E. S.....Butte
Baumgart, F. C.....Livingston
Benson, C. E.....Stevensville
Bissett, Joseph.....Park City
Baden, Philip.....Hamilton
Cuykendall, R. N.....Aberdeen S. D.
Cehrs, Adda V.....Bozeman
Carpenter, F. B.....Helena
Campbell, John S.....Reed Point
Crawford, Dwight E.....Shawmut
Carpenter, Alvin R.....Clyde Park
Cobleigh, Mrs. W. M.....Bozeman
Carpenter, W. M.....Logan
Cooper, F. O. Willow Creek
Carroll, J. T.....Helena
Churchwell E H.....Toston
Cravath, Mrs. E. W.....Bozeman
Conkling, Mrs. L. D.....Bozeman
Choate, Mrs. I. W.....Bozeman
Cooley, Mrs. F. S.....Bozeman
Cline, Mary E.....Bozeman
Cromwell, M. A.....Missoula
Cooper, Tom.....Helena
Coburn, Alex H.....Enid
McCune, Mrs. A. F.....Bozeman

Clark, P. A. Butte
Couch, Mrs. T. M. Stevensville
Dayharsh, Frank C. Stevensville
Dorr, Jas. Florence
Dawes, James S. Bozeman
Davis, Cornelius Bozeman
Davis, John M. Choteau
Davidson, Mrs. W. S. Bozeman
Dawe, Mrs. James S. Bozeman
Dawes, Mrs. W. C. Bozeman
Distad, John O. Valier
Davis, R. E. Willow Creek
Deatley, Gail Clyde Park
Daniels, Mrs. C. S. Deer Lodge
Enidcott, Roy Ballantine
Ellington, Minnie Manhattan
Fox, Edwin Missoula
Flaherty, Richard M. Cold Springs
Fossum, J. A. Somers
Finlay, Mrs. R. R. Bozeman
French, Herbert Bozeman
Fay, Odin B. Bozeman
Fay, Charles W. Bozeman
Foster, Glenn L. Helena
Griffin, H. P. Great Falls
Grande, A. C. Lennep
Green, Dorothy Belgrade
Grow, Mrs. Earl W. Lambert
Gilchrist, Edgar Belgrade
Good, H. C. East Helena
Gard, L. E. Bridger
Grinde, Henry Kalispell
Gray, Mrs. O. J. Bozeman
Gee, Mrs. Ned Bozeman
Gordon, E. G. Belgrade
Hayter, Charles Newton MeLeod
Herrett, Mrs. F. E. Bozeman
Hogan, Mrs. Ralph M. Musselshell
Hall, Miss Hazel Bozeman
Hogan, George R. Bozeman
Hansen, Charles L. Bozeman
Hulls, Hazel M. Manhattan
Hodgskiss, J. E. Choteau
Hirsch, Mrs. W. F. Straw
Hirsch, W. F. Straw
Hiatt, C. Arlee
Herbst, Mrs. A. C. Libby

Herbst, A. C. Libby
Henderson, C. A. Bozeman
Hines, M. Arrow Creek
Harper, Bellvaretta Bozeman
Hiatt, George Ringling
Higgins, Ross G. Ringling
Holden, J. D. Bozeman
Hillman, F. M. Kalispell
Houston, Mrs. E. L. Bozeman
Hudson, C. W. Norris
Hogan, Ralph M. Musselshell
Hulls, Mary V. Manhattan
Holgate, F. G. Sheridan
Harrer, Henry Belgrade
Henderson, Sollain Maudlow
Hetland, O. A. Joliet
Haight, Fred Great Falls
Hetland, Mrs. O. A. Joliet
Holliday, Samuel L. Clyde Park
Howe, Lee Helena
Hathhorn, J. R. Livingston
Haegele, Rowland W. Canton
Jackson, Mrs. E. W. Harrison
Jackson, Ernest Walter Harrison
Johnson, H. F. Bozeman
Jones, H. H. Gull Lake, Sasc., Canada
Jump, Clyde W. Bozeman
Jenkins, Thomas F. Twin Bridges
Jordan, Walter M. Butte
Johnson, O. J. Miles City
Koefs, James E. Helena
Knadler, Bernard M. Bozeman
Kremer, Frank Bozeman
Knudsen, C. Bozeman
Kinmouth, C. F. Ballantine
Kelly, Ernest B. Butte
Knowles, Ferdinand F. Hunters Hot Springs
Korab, Frank H. Lambert
Koehler, Earle E. Townsend
Kirk, Thomas S. Bozeman
Linfield, Eliza Bozeman
Lovely, Mrs. John A. Clyde Park
Lewis, G. M. Manhattan
Linfield, Mrs. F. B. Bozeman
Lawrence, F M. Missoula
Larsen, M. C. Bozeman
Lovely, John A. Clyde Park

Lauffer, A. C. Ashby, Nebr.
MacRae, Charles Woodside
McGee, Lawrence E. Bozeman
McGinley, Armour Bozeman
McVay, Ward Belgrade
Monforton, Remi Bozeman
Meade, W. H. Glacier Park
Mullen, Malcolm R. Glacier Park
Maynard, E. A. Bozeman
Mead, I. P. Huntley
Maxwell, Seth Helena
Melvin, James H. Billings
Milhiser, C. S. Billings
Myers, N. W. Billings
Morgan, Albert Menard
Metzel, Mrs. W. O. Alder
Malcolm, Stephen H. Helena
Marks, Alfred Clancy
Minder, Alfred Bozeman
Morgan, Mrs. L. J. Bozeman
Mapes, Mrs. W. W. Bozeman
Newcomb, Mrs. A. S. Mondak
Newcomb, A. S. Mondak
Nash, J. P. Clyde Park
Niel, William Stevensville
Nichols, Ernestine Bozeman
Olson, John L. Bozeman
Orcutt, Thomas R. Conrad
Penwell, Mrs. M. W. Belgrade
Platt, Arthur V. Como
Penwell, M. W. Belgrade
Penwell, Jean P. Belgrade
Penwell, Florence Belgrade
Piper, Mrs. George E. Glendive
Plew, Emma Elizabeth Bozeman
Piper, George E. Glendive
Pound, Edmund O. Billings
Parker, John B. Dixon
Parker, F. W. Springhill
Peets, John M. Bozeman
Peets, Mrs. John M. Bozeman
Patten, Mrs. G. Y. Bozeman
Ross, Alexander Chinook
Reed, F. B. Windham
Riley, Mrs. E. H. Bozeman
Rees, John Anaconda
Rees, Mrs. John Anaconda

Ross, Mrs. J. W. Bozeman
Robinson, C. A. Moore
Roberts, Otto P. Townsend
Rutledge, Mrs. A. F. Bozeman
Revo, Mrs. Walter E. Lambert
Randolph, C. F. Grass Range
Randolph, Mrs. C. F. Grass Range
Romudstad, John J. Fergus
Robinson, Jeffery Roberts
Ritz, H. F. Anaconda
Reed, Frederick T. Windham
Rosier, Willie Des Marysville
Roush, Roy Kalispell
Rosenaw, A. C. Billings
Robinson, Metcalf Roberts
Smith, J. C. Jefferson Island
Spring, G. W. Belgrade
Stone, D. P. Belgrade
Schweitzer, J. S. Bozeman
Smith, O. W. Belgrade
Sanford, George O. Powell, Wyo.
Siquin, K. K. Wilsall
Schurch, Walter E. Deer Lodge
Smith, Kirk Livingston
Stillman, A. Z. Salesville
Storm, Mrs. Clarence Vaughn
Selway, Alice M. Bozeman
Sime, Mrs. C. E. Bozeman
Steinbrink, Otto C. Columbus
Scahell, John R. Bozeman
Sueing, J. L. Sheridan
Switzer, Mrs. T. B. Bozeman
Schroeder, Mrs. F. Bozeman
Taylor, Mrs. J. C. Miles City
Thayer, Laurence H. Bearmouth
Thayer, Lester B. Bearmouth
Toothaker, J. R. Whitehall
Thompson, W. T. Bozeman
Taylor, J. C. Miles City
Thersen, Frank Bozeman
Trace, Mrs. A. L. Laurel
Taber, Mrs. Charles S. Bozeman
Tretsven, Mrs. Oscar Bozeman
Toothaker, F. K. Red Lodge
Turman, Mrs. Ella Toston
Tice, Maud Logan
Ulmer, Mrs. S. A. Bozeman
Vanderpool, Edward Denton

Wilcomb, Mrs. F. H. Laurin
Waite, Mrs. P. C. Bozeman
Woodgerd, Mrs. Orville Whitehall
Woodgerd, O. T. Whitehall
Williams, L. C. Menard
Weaver, James H. Bearmouth
Webster, George H. White Sulphur Springs
Weedman, H. S. Shawmut
Wyatt, Mrs. J. R. Bozeman
Wilson, Harmon Bozeman
Withington, H. S. Forsyth
Wilson, Mrs. M. R. Bozeman
Wheeler, Shelton K. Hesper
Weckerly, J. E. Nihill
Wehr, John H. Denton
Wehr, C. R. Denton
Westlake, A. E. Bozeman
Whitcomb, Abigail H. Bozeman
Wilcomb, Frank H. Laurin
Weekes, Samuel M. Helena
Wilson, Maude Parker Bozeman
Walrath, A. J. Bozeman
Walrath, Mrs. A. J. Bozeman
Wortman, Mrs. M. Olive Bozeman
Wipf, J. W. C. Belgrade
Yergey, Mrs. Alford L. Bozeman
Yergey, Alford L. Bozeman
Young, Mrs. Mary Bozeman

Music Students

Armstrong, Mrs. V. T.	Voice	Bozeman
Allen, Mollie	Piano	Butte
Bartz, Florence	Violin	Bozeman
Blair, Dorothy	Violin	Bozeman
Brown, Mrs. Fred	Piano	Bozeman
Beerstecher, Ada	Piano	Belgrade
Burkman, Edith	Piano	Idaho Falls, Idaho
Borthwick, Alberta	Voice	Hamar, N. Dak.
Burgess, R. H.	Voice	Helena
Cobleigh, Winifred	Piano	Bozeman
Clopton, Myrtis	Piano	Bozeman
Chamberlain, Elsie	Piano	Stockton, Kans.
Cannon, Raymond	Voice	Bozeman
Carn, Mrs. D. F.	Voice	Bozeman
Cooley, George A.	Voice	Bozeman
Cravath, Florence	Voice	Sidney
Cooley, Esther B.	Piano	Bozeman
Charters, Naomi	Piano	Grass Range
Chapman, Nora	Voice	Bozeman
Carroll, Bertha G.	Piano	Bozeman
Clarkson, Robert	Violin	Bozeman
DeCamp, Renan	Piano	Helena
Duquette, Jay	Piano	Potomac
Emhoff, Elizabeth	Piano	Stevensville
Esgar, Rea	Piano	Bozeman
Fransham, Edna	Piano, Voice	Bozeman
Ferguson, Maude	Voice	Bozeman
Fowler, Edith	Piano	Great Falls
French, Zada	Piano	Bozeman
Gerber, Lillian	Piano, Voice	Sand Coulee
Garvin, John	Piano	Osakis, Minn
Gray, David	Violin	Choteau
Grupp, Meta	Piano	Bozeman
Heath, Valeria	Piano	Bozeman
Hollier, Georgia	Voice	Bozeman
Hoppel, Fred	Voice	Bozeman
Hutton, Dorothy	Piano	Bozeman
Hartman, June	Ensemble	Bozeman
Hoyle, Alfred	Violin	Bozeman
Hanks, Clementine	Violin	Bozeman
Howard, Josephine	Violin	Bozeman

Hutton, Donald	Violin	Bozeman
Hollier, Myrtle	Violin	Bozeman
Hoyem, George	Violin	Lennep
Hodgskiss, Ursula	Piano	Choteau
Hodgskiss, Ruby	Piano	Choteau
Ingram, Craig	Piano	Helena
Jaeckel, C. O.	Voice	Anaconda
Johnson, Jessie	Voice	Belt
Johnson, Stella	Voice	Bozeman
Jones, Marguerite	Voice	Bozeman
Jones, Ray	Violin	Bozeman
Jacobs, Edward	Violin	Delta, Colo.
Johnson, Maurice	Violin	Bozeman
Kinsella, Olive	Voice	Bozeman
Kirschner, Hortense	Voice	Bozeman
Kirby, Etta	Piano, Voice	Gebo, Wyo.
Kirk, Christine	Piano	Bozeman
Kammerer, Sophia	Ensemble	Bozeman
Kelty, Edwin	Piano	Bozeman
Kelly, Jeanette	Voice	Deer Lodge
King, Kenneth	Voice	Whitehall
Lacher, Opal	Piano, Voice	Kalispell
Lund, Janelle	Voice	Three Forks
Lehfeldt, Hedwig	Voice	Broadview
LeVeque, Evelyn	Voice	Bozeman
Linse, Louise	Piano, Voice	Everson
Lessel, Erma	Piano	Butte
Ladenburg, Carl	Piano	Columbia Falls
Linfield, Azalea	Piano	Bozeman
Linfield, Leila	Piano	Bozeman
Miewald, Ethel	Voice	Chinook
McMillan, Ina	Piano	Glengarry
Monroe, Mrs. M. G.	Piano, Voice	Manhattan
Merigold, March	Piano	Kalispell
Maxwell, Lela	Ensemble	Bozeman
McIver, Grace	Piano	Great Falls
Milnor, Estella	Piano	Troy
McCone, Veronica	Piano	Bozeman
McCone, Alice	Piano	Glendive
Noble, Ruth	Piano	Great Falls
O'Donnely, Kathleen	Violin	Bozeman
Pease, Edith	Violin	Bozeman

Phillips, Madeline	Ensemble	Bozeman
Paul, Gladys	Piano	White Sulphur Springs
Payne, Elsie	Piano	Kimball
Pease, Muriel	Piano	Bozeman
Parker, Helen	Voice	Bozeman
Riddell, Marsa	Voice	Helena
Ritz, Gladys	Voice	Anaconda
Robinson, E. C.	Voice	Lewistown
Rapatz, Eugene	Violin	Havre
Rose, Helen	Piano	Bozeman
Ronne, Edwin	Piano	Chinook
Rush, Winnie	Piano	Bozeman
Reed, Mrs. Dave	Voice	Bozeman
Schrammeck, George	Voice	Bozeman
Smith, Alberta	Voice	Bozeman
Stanley, Amelia	Voice	Great Falls
Stewart, Mildred	Voice	Bozeman
Saltz, L. W.	Voice	Dundee, Mich.
Stayner, Fay	Piano	Bozeman
Stadler, Marie	Piano	Helena
Shipps, Marie	Piano	Maryville, Mo.
Smith, Ruth	Piano	Salina, Kans.
Walker, Cecil	Voice	Bozeman
Woodward, Otto	Voice	Willow Creek
Wilson, Eloise	Piano	Bozeman
Whiteside, John	Piano	Kalispell
Ziebarth, Dorothy	Piano	Chinook

Summary of Students

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Seniors	38	
Juniors	57	
Sophomores	79	
Freshmen	117	
Irregulars	6	
Four Year Secondary Students	59	
School of Agriculture	106	
School of Mechanic Arts	8	
School of Home Economics	10	
Traction and Stationary Engine License Course	14	
Total		503
Music	110	
(Not counted twice)		40
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(Not counted twice)		117
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Grand Total		979

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COURSE FOR NURSES.
SECONDARY SCHOOLS OF AGRICULTURE,
HOME ECONOMICS, MECHANIC ARTS

TWENTY-FOURTH ANNUAL CATALOGUE

1916-1917

ANNOUNCEMENTS FOR
1917-1918

BOZEMAN, MONTANA
MAY 1917

Entered at Bozeman, Montana, as Second Class Matter Under Act of Congress July 16, 1894.

THE UNIVERSITY OF MONTANA

The University of Montana is constituted under the provisions of Chapter 92 of the Laws of the Thirteenth Legislative Assembly, March 14, 1913 (effective July 1, 1913.)

The general control and supervision of the University are vested in the State Board of Education. The Chancellor of the University is the chief executive officer. For each of the component institutions there is a local executive board.

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S. C. Ford, Attorney General.....Ex-officio
May Trumper, Supt. of Pub. Instruction.....Ex-officio, Secretary

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Edward C. Elliott, Chancellor of the University.

The University comprises the following institutions, schools and departments.

THE STATE UNIVERSITY at Missoula.

Established February 17, 1893, and consisting of

The College of Arts and Sciences	The School of Music
The School of Law	The Summer Session
The School of Pharmacy	The Biological Station (Flathead Lake)
The School of Forestry	The Extension Service
The School of Journalism	

The Graduate Department

Frederick C. Scheuch, Acting President.

THE STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS at Bozeman.

Established February 16, 1893, and consisting of

The College of Agriculture	The Secondary Schools
The College of Engineering	Home Economics
The College of Applied Science	Mechanic Arts
The College of Household and Industrial Arts	Agriculture
	The Summer Session
Courses for Vocational Teachers	Course for Nurses
The Agricultural Experiment Station	The Agricultural Extension Service

The Engineering Extension Service

James M. Hamilton, President.

THE STATE SCHOOL OF MINES at Butte

Established February 17, 1893.

Charles H. Bowman, President.

THE STATE NORMAL COLLEGE at Dillon

Established February 23, 1893, and consisting of

The Two-years Elementary Course	The Four-years Course
The Three-years Course	The Graduate Course

Joseph E. Monroe, President.

For publications and detailed information concerning the different schools and colleges address the President of the particular institution concerned. Communications intended for the Chancellor of the University should be addressed to the State Capitol, Helena, Montana.

UNIVERSITY OF MONTANA BULLETIN

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COURSES FOR VOCATIONAL TEACHERS
COURSE FOR NURSES.
SECONDARY SCHOOLS OF AGRICULTURE,
HOME ECONOMICS, MECHANIC ARTS

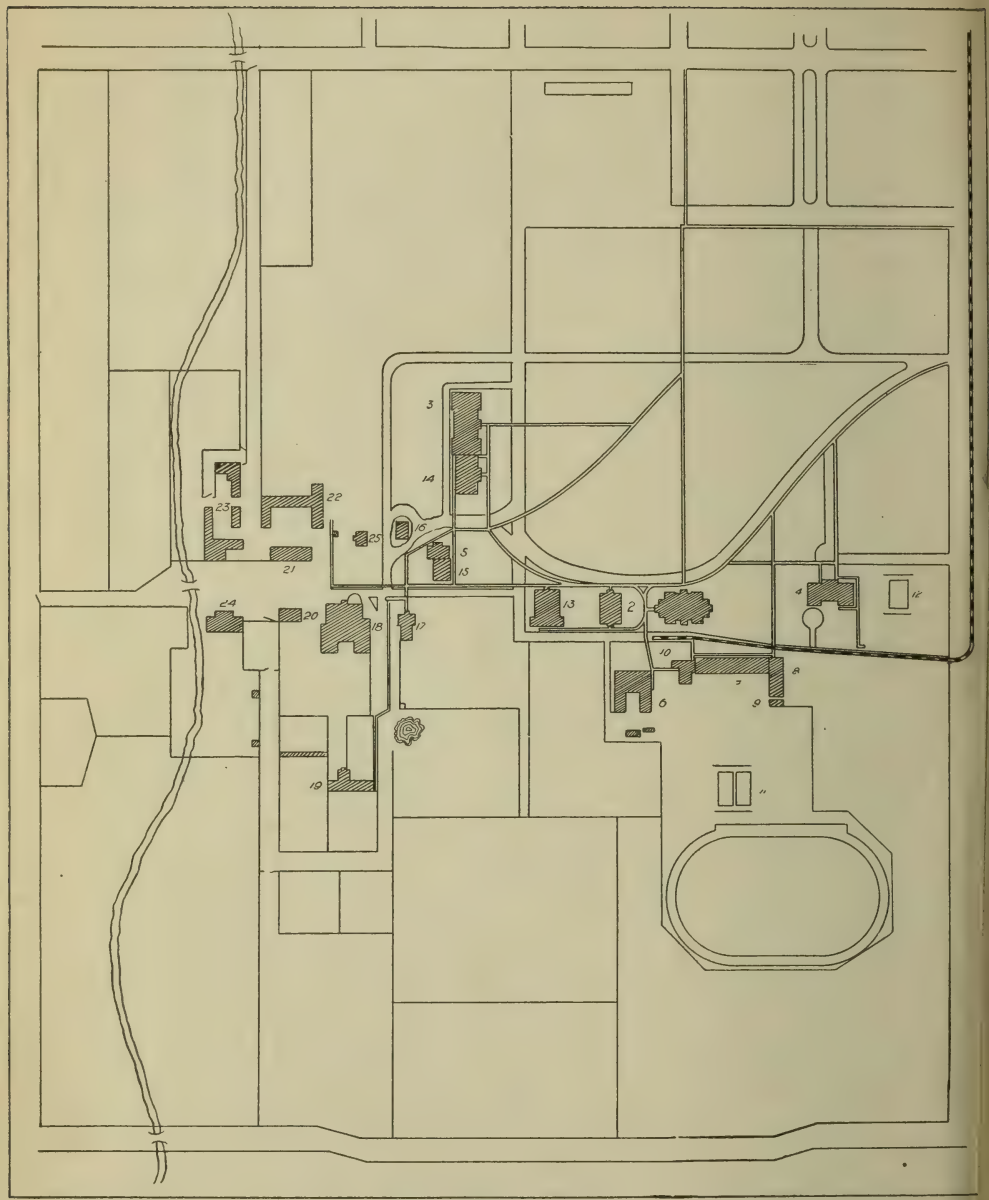
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1917-1918

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1. Montana Hall.
2. Chemistry Building. (Destroyed by fire Oct. 20, 1916.)
3. Agricultural Hall.
4. Hamilton Hall.
5. Biology Building.
6. Shops.
7. Engineering Laboratory.
8. Electrical Engineering Lab.
9. Cement Laboratory.
10. Heating Plant.
11. Tennis Courts.
12. Tennis Court for Women.
13. Gymnasium and Drill Hall.
14. Horticultural Greenhouse.
15. Biological Greenhouse.
16. Lower Heating Plant.
17. Veterinary Building.
18. Cattle Barn.
19. Poultry Houses.
20. Granary.
21. Horse Barn.
22. Implement Sheds.
23. Sheep Barn and Piggery.
24. Feeding Barn.
25. Club House.

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Calendar

1917.

June 11, Mon., ... Summer Session Begins

July 4, Wed., ... Independence Day, a Holiday.

July 20, Fri., ... Summer Session Ends.

Sept. 11-12, Tues.-Wed., ... Registration and Examinations for Entrance and Conditions.

Sept. 13 Thurs., 8:00 A. M., ... Instruction Begins.

Oct. 2-3, Tues.-Wed., ... Registration and Examinations for Entrance and Conditions for Six Months Courses.

Oct. 4, Thurs., 8:00 A. M., ... Instruction begins in Six Months Courses.

Oct. 12, Fri., ... Columbus Day.

Oct. 26, Fri., ... Standing of College Students Reported.

Nov. 9, Fri., ... Standing of Six Months Course Students Reported

Nov. 28, Wed., 12 Noon Thanksgiving Recess Begins.

Dec. 3, Mon., 8:00 A. M., ... Thanksgiving Recess Ends.

Dec. 14, Fri., ... Standing of College Students Reported.

Dec. 20-21, Thurs.-Fri., ... Examinations for Students in Six Months Courses.

Dec. 21, Fri., 12:00 Noon Christmas Vacation begins and First Semester of the Six Months Courses Ends.

1918.

Jan. 3, Thurs., 8:00 A. M., ... Christmas Vacation Ends. Registration Second Semester in Six Months Courses.

Jan. 4, Fri., 8:00 A. M., ... Instruction in Six Months Courses Begins.

Jan. 21-24, Mon.-Thurs., ... Examinations in College Courses.

Jan. 24, Thurs., ... First Semester College Courses Ends

Jan. 25-26., Fri.-Sat., ... Registration Second Semester College Courses and Examinations for Entrance and Conditions.

Jan. 28, Mon., 8:00 A. M., ... Instruction in College Courses Begins.

Feb. 12, Tues.,.....Lincoln's Birthday.

Feb. 15, Fri.,.....Standing of Students in Six Months Courses Reported.

Feb. 16, Sat.,.....Founders Day.

Feb. 22, Fri.,.....Washington's Birthday.

Mar. 6-7-8-9, Wed., Thurs., Fri. Sat.,..Interscholastic Basket Ball Tournament.

Mar. 15, Fri.,.....Standing of College Students Reported.

March 28, Thurs.,.....Commencement Six Months Courses

Mar. 29, Fri.,.....Second Semester Six Months Courses Ends.

April 26, Fri.,.....Standing of College Students Reported.

May 30, Thurs.,.....Memorial Day, a Holiday.

May 31-Jun. 4.,Fri., Sat., Mon., Tues...Examination in College Courses.

June 2, Sun., 8:00 P. M.,.....Baccalaureate Services.

June 5, Wed.,.....Commencement Day.

June 10, Mon.,.....Summer Session Begins.

Sept. 10-11, Tues., Wed.,.....Registration and Examinations for Entrance and Conditions.

EXECUTIVE BOARD.

JAMES M. HAMILTON (ex-officio), Chairman.....Bozeman

(By Appointment)

J. H. BAKER.....Bozeman

(Term Expires April 1919)

W. S. DAVIDSON.....Bozeman

(Term Expires April 1921)

ROSS H. FILLION, Secretary-Treasurer.....Bozeman

ADMINISTRATIVE OFFICERS.

EDWARD C. ELLIOTT, Ph. D.....Chancellor, University of Montana
JAMES M. HAMILTON, M. S.....President
FREDERICK B. LINFIELD, B. S. A.....Director, Experiment Station
FRED S. COOLEY, B. S.....Director, Extension Service
UNA B. HERRICK.....Dean of Women
JOHN H. HOLST.....Principal, Secondary Schools and Director, Summer Session.
R. ORVIS WILSON, B. S.....Registrar
ROSS H. FILLON.....Secretary-Treasurer
JOHN. C. PARK.....Superintendent of Buildings

THE FACULTY.

Professors.

ABNETT, CLARE NEWTON, B. S. A. (Purdue University)
Professor of Animal Husbandry.

ATKINSON, ALFRED, B. S. (Iowa State College)
M. S. (Cornell University)
Professor of Agronomy.

BENNION, FRED, A. B. (University of Utah)
Physical and Athletic Director.

BREWER, WILLIAM F., A. B. (Grinnell College)
A. M. (Grinnell College)
A. M. (Harvard University)
Professor of English.

CLARK, HOLLIS C., (West Point, Captain United States Army)
Professor of Military Science and Tactics.

COBLEIGH, WILLIAM M., E. M. (College of Montana)
A. M. (Columbia University)
Professor of Chemistry.

COOLEY, ROBERT A., B. S. (Massachusetts Agricultural College.)
Professor of Entomology and Zoology.

CONKLING, LEON D., C. E. (Cornell University)
Professor of Civil Engineering.

CURRIER, AARON H., A. B. (Oberlin College)
A. M. (Oberlin College)
Director of the School of Music and Professor of Vocal Music.

*FORREST, ELIZABETH, B. L. S. (University of Illinois)
Librarian.

HAMILTON, JAMES M., B. S. (Union Christian College)
M. S. (Union Christian College)
President and Professor of Psychology and Economics.

HAM, FRANK, B. S. (Montana State College)
M. S. (Montana State College)
Professor of Physics.

HARKINS, LILLA A., B. S. (South Dakota State College)
M. S. (South Dakota State College)
Professor of Home Economics.

HERRICK, UNA B.
Dean of Women and Director of Physical Education for Women.

*On leave of absence

HOLST, JOHN H.
Principal of the Secondary Schools, and Director of the Summer Session, and Assistant Professor of English.

LINFIELD, FREDERICK B., B. S. A. (Ontario Agricultural College)
Dean of Agriculture.

MARTIN, GEORGE LESTER, B. S. (Iowa State College)
Professor of Dairy Husbandry.

NASH, W. GIFFORD
Professor of Piano Music.

PLEW, WILLIAM R., B. S., (Rose Polytechnic Institute)
M. S., (Rose Polytechnic Institute)
Professor of Architectural and Civil Engineering.

RICHTER, ARTHUR W., B. M. E. (University of Wisconsin)
M. E. (University of Wisconsin)
M. M. E. (Cornell University)
Dean of Engineering and Professor of Mechanical Engineering.

SCHOPPE, WILLIAM F., B. S. (University of Maine)
M. S. (University of Maine)
Professor of Poultry Husbandry.

STOUT, ELIZABETH, B. L. S. (University of Illinois)
A. B. (University of Illinois)
Librarian.

SWINGLE, DEANE B., B. S. (Kansas State Agricultural College)
M. S. (University of Wisconsin)
Professor of Botany and Bacteriology.

TALLMAN, WILLIAM D., B. S. (University of Wisconsin)
Professor of Mathematics.

THALER, JOSEPH A., E. E. (University of Minnesota)
Professor of Electrical Engineering.

WELCH, HOWARD, A. B. (University of Missouri)
B. S. A. (University of Missouri)
D. V. M. (Cornell University)
Professor of Veterinary Science.

WHIPPLE, ORVILLE B., B. S. (Kansas State Agricultural College)
Professor of Horticulture.

Assistant Professors.

BALDWIN, LANA A.
Assistant Professor of Art.

BALLINGER, FLORENCE
Assistant Professor of Domestic Art.

BÓGUE, ROBERT H., B. S. (Tufts College)
M. S. (Massachusetts Agricultural College)
Assistant Professor of Chemistry.

BREWER, HELEN R., A. B. (Grinnell College)
Assistant Professor of History.

CEHRS, CARRIE, M., A. B. (University of Denver)
A. M. (University of Denver)
Assistant Professor of German.

CHALLENDER, RALPH T., B. S. (Kansas State Agricultural College)
Assistant Professor of Mechanical Engineering.

CURRIER, EDWIN L., B. S. (University of Nebraska)
Assistant Professor of Farm Management.

DUDDY, EDWARD A., A. B. (Bowdoin College)
A. M. (Harvard University)
Assistant Professor of English.

FOOTE, HERBERT B., B. S. (Ottawa University)
M. A. (Kansas University)
Assistant Professor of Botany and Bacteriology

FORD, CARLOTTA MARKS, A. B. (University of Illinois)
Assistant Professor of Home Economics.

*JENNISON, HARRY M., B. S. (Massachusetts Agricultural College.)
M. A. (Wabash College)
Assistant Professor of Botany and Bacteriology

JOSEPH, W. E., B. S. (Purdue University)
Ph. D. (University of Illinois)
Assistant Professor of Animal Husbandry.

MURDOCK, HARVEY E., B. S. (University of Colorado)
M. E. (University of Illinois)
C. E. (University of Illinois)
Assistant Professor of Farm Mechanics.

MCCHORD, R. C., A. B. (Central University)
B. S. A. (Iowa State College)
Assistant Professor of Animal Husbandry.

SNOW, FRANK C., C. E. (Ohio State University)
Assistant Professor of Civil Engineering.

SPAULDING, MILO HERRICK, A. B. (Leland Stanford Junior University)
A. M. (Leland Stanford Junior University)
Assistant Professor of Zoology.

STARRING, CECIL C., B. S. (South Dakota State College)
Assistant Professor of Horticulture.

*On leave of absence

WHITCOMB, WILLIAM O., B. S. A. (North Dakota Agricultural College)
M. S. A. (Cornell University)
Assistant Professor of Agronomy.

WOHLENBERG, WALTER J., B. S. (University of Nebraska)
M. S. (University of Illinois)
Assistant Professor of Mechanical Engineering.

Instructors.

BULL, FRIEDA M., B. S. (Montana State College)
M. S. (Montana State College)
Instructor in Mathematics.

BLOSS, FRED, (Sergeant, Regular Army Reserve)
Assistant in Military Science and Tactics.

*HAINES, WILL T., B. S. (Montana State College)
Instructor in Electrical Engineering.

HARTMAN, JUNE, B. S. (Montana State College)
Instructor in Piano.

HOMANN, FREDERICK C., B. S. (Montana State College)
Instructor in Mechanical Engineering.

HOWARD, LOUIS L.
Instructor in Band Music.

HYTREE, EDWARD C., B. S. (Ohio Wesleyan University)
A. M. (Ohio State University)
Instructor in Chemistry.

JACKSON, FRED O
Instructor in Violin and Orchestra.

JONES, THEDA M.
Instructor in Stenography and Typewriting.

KATELY, FRED
Instructor in Forge and Foundry.

KIEFER, JAMES A., B. S. (Montana State College)
Instructor in Physics.

LIBBY, RALPH, B. S. (Dartmouth College)
M. C. S. (Amos Tuck School of Administration and Finance, Dartmouth College)
Instructor in Secretarial Studies.

MILLER, F. CLIFFORD, B. S. (James Millikin University)
Instructor in Mechanical Engineering.

*On leave of absence

MOORE, MURIEL
Instructor in Art.

QUAW, MIGNON M., B. S. (Montana State College)
A. M. (Columbia University)
Instructor in English.

ROLFE, AMY L., A. B. (University of Illinois)
A. M. (Columbia University)
Instructor in Home Economics.

SHEA, HENRY M., Ph. G. (South Dakota State College)
B. S. (South Dakota State College)
M. S. (South Dakota State College)
Food and Drug Analyst.

SLOAN, ROYAL D., B. S. (University of Montana)
Instructor in Electrical Engineering.

WALLIN, FLORENCE, A. B. (State University of Iowa)
Instructor in French and Spanish.

Assistants.

GOTTSCHALCK, CARL, B. S. (Montana State College)
M. S. (Montana State College)
Assistant in Chemistry and Assistant Analyst in State Food and Water Laboratory.

MCKINNEY, EVA
Assistant in Physical Education for Women.

PARK, JOHN C.
Assistant in Engineering.

POWELL, GREGORY S., A. B. (University of Montana)
Assistant in English

SEAMANS, HOWARD L., B. S. (Montana State College)
Assistant in Entomology.

TRETSVEN, OSCAR
Assistant in Animal Husbandry.

EXPERIMENT STATION STAFF

LINFIELD, FREDERICK B., B. S. A. (Ontario Agricultural College)
Director.

Department Heads.

ARNETT, CLARE NEWTON, B. S. A. (Purdue University)
Animal Husbandry.

ATKINSON, ALFRED, B. S. (Iowa State College)
M. S. (Cornell University)
Agronomy.

BURKE, EDMUND, B. S. (Montana State College)
Chemistry and Meteorology.

COOLEY, ROBERT A., B. S. (Massachusetts Agricultural College)
Entomology.

CURRIER, EDWIN L., B. S. (University of Nebraska)
Farm Management.

MURDOCK, HARVEY E., B. S. (University of Colorado)
M. E. (University of Illinois)
C. E. (University of Illinois)
Agricultural Engineer.

SCHOPPE, WILLIAM F., B. S. (University of Maine)
M. S. (University of Maine)
Poultry.

SWINGLE, DEANE B., B. S. (Kansas State Agricultural College)
M. S. (University of Wisconsin)
Botany and Bacteriology.

WELCH, HOWARD, A. B. (University of Missouri)
B. S. A. (University of Missouri)
D. V. M. (Cornell University)
Veterinary.

WHIPPLE, ORVILLE B., B. S. (Kansas State Agricultural College)
Horticulture.

WHITLOCK, BERT W., B. S. (Kansas State Agricultural College)
Superintendent of Grain Laboratory.

Department Assistants.

BLISH, MORRIS J., B. S. (University of Nebraska)
A. M. (University of Nebraska)
Ph. D. (University of Minnesota)
Chemistry.

FOX, D. S., B. S. (Cornell University)
Farm Management.

GIESEKER, LEONARD F., B. S. (University of Nebraska).
M. S. A. (Cornell University)
Agronomy.

JAHNKE, EMIL W., B. S. (University of Minnesota)
Grain Laboratory.

JONES, RAY S., B. S. (Montana State College)
Chemistry.

JOSEPH, W. E., B. S. (Purdue University)
Ph. D. (University of Illinois)
Animal Husbandry.

LESSEL, ERMA, B. S. (Montana State College)
Chemistry.

*MORRIS, H. E., B. S. (Montana State College)
Botany and Bacteriology.

NELSON, JOSEPH B.
Agronomy.

PARKER, JOHN R., B. S. (Massachusetts Agricultural College)
Entomology.

PINCKNEY, REUBEN M., B. S. (Nebraska Wesleyan University)
A. M. (University of Nebraska)
Chemistry.

*QUINN, E. J., B. S. (Notre Dame University)
Chemistry.

STARRING, CECIL C., B. S. (South Dakota State College)
Horticulture.

STUDHALTER, R. A., B. S. (University of Texas)
Botany and Bacteriology.

TRETSVEN, OSCAR
Animal Husbandry.

SUBSTATIONS.

Judith Basin Substation, Moccasin.

STEPHENS, JOHN M.
Superintendent.

DONALDSON, NOBLE C., B. S. (Montana State College)
Assistant.

MOOMAW, LEROY, B. S. (Missouri State University)
Assistant.

North Montana Substation, Havre

MORGAN, GEORGE, B. S. (Montana State College)
Superintendent.

*One leave of absence.

Huntley Substation, Huntley

HANSEN, DAN,
Superintendent.

NOBLE, EDWARD, B. S. (Montana State College)
Assistant.

SEAMANS, ARTHUR, B. S., (Montana State College)
Assistant.

Horticultural Substation, Corvallis.

ASHBY, J. N.
Foreman.

AGRICULTURAL EXTENSION STAFF.

COOLEY, FRED S., B. S. (Massachussets Agricultural College)
Director.

ABBEY, M. J., A. B. (Brown University)
Leader of Boys' and Girls' Clubs.

BEERS, WAYLAND L., B. A. (Brown University)
Market Specialist.

CHASE, F. JOSIAH, B. S. (University of Nebraska)
Farm Management Demonstrator.

HARTMAN, WILLIAM J., B. S. A. (Ontario Agricultural College)
D. V. M. (Chicago Veterinary College)
Live Stock Specialist.

HILLMAN, FRANK M., B. S. (University of Minnesota)
Dairy Specialist.

OGILVIE, MINA, M. S. (Iowa State College)
Home Economics Specialist.

ROWE, BESS M., B. S. (University of Minnesota)
Home Economics Specialist.

WILSON, MILBURN LINCOLN, B. S. A. (Iowa State College)
State Leader of County Agents.

County Agriculturists.

ANDERSON, E. W., B. S. A. (North Dakota Agricultural College)
Sheridan County, Plentywood.

BANKER, PAUL P., B. S. (University of Wisconsin)
Hill County, Havre.

BUSH, C. F. (University of Minnesota)
Flathead County, Kalispell.

CAMPBELL, J. R., B. S. (Iowa State College)
M. S. (Iowa State College)
Missoula County, Missoula.

ENERSON, A. E., B. S. (University of Minnesota)
Cascade County, Great Falls.

PETERSON, CARL H.
Fergus County, Lewistown.

SKUSE, W. W., B. S. (Washington State College)
C. E. (Washington State College)

YERRINGTON, C. M., B. S. (North Dakota Agricultural College)
Custer County, Miles City.

SUMMER SESSION.

HOLST, JOHN H.
Director.

Faculty.

ABBEY, M. J., A. B. (Brown University)
Agriculture and Nature Study.

BULL, MARY F.
Common Branches and Methods.

CHALLENDER, RALTH T., B. S. (Kansas State Agricultural College)
Manual Training.

COBLEIGH, WILLIAM M., E. M. (College of Montana)
A. M. (Columbia University)
Chemistry.

COOLEY, ESTHER B., B. S. (Montana State College)
Home Economics.

DAVIS, IDA M.
School Law and Methods.

FOOTE, HERBERT B., B. S. (Ottawa University)
M. S. (Kansas University)
Botany.

HAMILTON, JAMES M., B. S. (Union Christian College)
M. S. (Union Christian College)
Psychology and History of Montana.

HOLST, JOHN H.
The Rural School

LIND, JENNY,
Public School Drawing.

MARTIN, GEORGE L., B. S. (Iowa State College)
Dairy.

NORTON, MRS. LAURA
Public School Music and Community Singing.

PECK, GERTRUDE
Rural Primary Methods.

ROWE, ELFIE A., A. B. (University of Minnesota)
Home Economics and Teacher's Training.

STARK, MADGE
Common Branches and Methods.

WHIPPLE, O. B., B. S. (Kansas State Agricultural College)
School and Home Gardening.

WHITCOMB, WILLIAM O., B. S. A. (North Dakota Agricultural College)
M. S. A. (Cornell University)
Soils and Crops.

WITTEN, M. WRAY
Rural School Management.

Special Lecturers.

EDWARD C. ELLIOTT.....Chancellor University of Montana

MAY TRUMPER.....State Superintendent of Public Instruction

MABEL CARNEY.....Supervisor Teacher Training Departments, Minnesota

A. E. WINSHIP.....Editor Journal of Education, Boston

JOSEPHINE CORLISS PRESTON.....State Superintendent of Public Instruction, Washington

GEORGE D. STRAYER.....Professor Educational Administration Teachers College, Columbia University, New York.

J. P. ROWE.....Professor of Geology, State University, Montana

P. W. DYKEMA.....Professor of Music, State University, Wisconsin

L. W. RAPEER.....Professor of Education, State College, Pennsylvania

J. E. MONROE.....President State Normal College, Montana

FACULTY COMMITTEES

ABSENCE:
Atkinson, Mrs. Herrick, Richter.

ATHLETICS:
Swingle, Bennion, Tallman.

BUILDINGS AND GROUNDS:
Linfield, Park, Whipple.

COMMENCEMENT:
Hamilton, Nash, Miss Baldwin.

ELIGIBILITY.
Hamilton, Schoppe, Wilson.

GRADUATE STUDIES:
Cooley, Atkinson, Thaler.

INTERSCHOLASTIC:
Bennion, Tallman, Duddy, Atkinson, Blish, Wilson.

PUBLICATIONS:
Brewer, Plew, Cobleigh

RECOMMENDATIONS FOR POSITIONS:
Wilson, Miss Harkins, Burke.

REGISTRATION:
Ham, Miss Brewer, Holst.

SCHEDULE:
Tallman, Arnett, Conkling.

SCHOLARSHIP:
Ham, Miss Cehrs, Martin.

STUDENT AFFAIRS:
Miss Brewer, Spaulding, Mrs. Herrick, Whitcomb, Miss Ballinger

STUDENT LOAN:
Richter, Linfield, Mrs. Herrick.

University of Montana.

HISTORICAL SKETCH

An Act of Congress approved February 18, 1881, dedicated for university purposes in Montana, seventy-two sections of the public domain. The Enabling Act, providing for the organization of the State of Montana and its admission to the Union, February 22, 1889, confirmed this grant to the State and added one-hundred thousand acres for a school of mines, one-hundred thousand for normal schools, and one-hundred and forty thousand acres for an agricultural college.

The Third Legislative Assembly of the State of Montana, in February 1893, enacted laws providing for the establishment of all these institutions, and locating the State University at Missoula, the State School of Mines at Butte, the State Normal College at Dillon, and the State Agricultural College at Bozeman.

As the lands granted for higher educational purposes, together with timber or stone thereon, have been sold, the proceeds have gone into permanent funds invested for the various institutions, and the interest on these funds, together with the rentals of unsold lands, has been used for the support of the respective institutions. These maintenance resources have been supplemented with appropriations made each subsequent biennium by the Legislative Assembly, which has also provided for the erection of buildings at the expense of the State.

These institutions were administered independently by local executive boards for some years under the general supervision of the State Board of Education; by a law of 1909 the powers of the local boards were more closely defined and the direction of the State Board of Education made more effective. By the enactment of Chapter 92 of the Laws of the Thirteenth Legislative Assembly in 1913 the four institutions were combined into the University of Montana under the executive control of an officer whose title is Chancellor. In October, 1915, the State Board of Education appointed Edward C. Elliott, then of the University of Wisconsin, as the first Chancellor of the University of Montana. He assumed his duties February 1, 1916.

State College of Agriculture and Mechanic Arts.

HISTORICAL SKETCH

By an Act of the Third Legislative Assembly of Montana, February 16, 1893, and signed by Governor J. E. Rickards, the Agricultural College of the State of Montana was located at Bozeman. This act provided for an Executive Board which should have the immediate control and direction of the affairs of the College, subject only to the general supervision of the State Board of Education. The Executive Board was authorized to appoint a Secretary and Treasurer and to choose a president and faculty.

On March 21, 1893, the State Board of Education held its first meeting at Bozeman. A site of forty acres for campus was donated by Nelson Story, Sr. An adjoining one-hundred and sixty acres of land owned by Gallatin County and used for a "poor farm" was donated, one-half by the County and one-half by citizens of Bozeman. An Executive Board was appointed. The Executive Board chose Luther Foster for Acting President. On April 17, with the president and an assistant, instruction was begun. Eight students were enrolled and the term continued ten weeks. September 15, the College opened for its first full year's work. A. M. Ryan was President and the faculty numbered six. Courses were offered in agriculture, domestic economy, and applied science, the last being chiefly engineering and chemistry. There was also established a one year preparatory course, a two-year business course modeled after the usual private business college, and a music department.

Nelson Story, Sr., donated the use of a frame building which had been occupied as a Presbyterian Academy. The public school board allowed the use of some rooms in a nearby school building. During the summer of 1894 the brick veneer building now used for biology was erected out of the Hatch Experiment Station Fund.

In June 1894, James Reid was elected President and entered upon his duties in September.

The Legislative Assembly in 1895 authorized a bond issue of $100,000.00 to provide funds to erect and furnish buildings for the college.

In September 1904, James Reid resigned as President and was succeeded by J. M. Hamilton.

The College has the following organization, i. e., the College of Agriculture; the College of Engineering; the College of Applied Science; the College of Household and Industrial Arts; Training fo/

Vocational Teachers; Graduate Course for Nurses; the Secondary Schools in Agriculture, Home Economics and Mechanic Arts, and the Summer Session.

Founders Day.

The Act passed by the Third Legislative Assembly locating and establishing the College of Agriculture and Mechanic Arts at Bozeman was approved by Governor J. E. Rickards, February 16, 1893. The Twenty-fifth Anniversary will occur February 16, 1918 and will be observed by appropriate exercises.

PURPOSE AND SCOPE.

The purpose of the colleges of agriculture and mechanic arts is chiefly to provide industrial education in agriculture, engineering, household economy, and applied science, for the young men and women of the respective states in which they are located. The scope of the Montana State College is set forth in the two so-called Morrill Acts of Congress, which authorized this class of institutions and supplied in part endowment and funds for maintenance; and in an act of the Montana Legislature accepting the land and money grants from the national government.

The first Morrill Act of Congress of July 2, 1862, making a land grant for the partial endowment of the agricultural and mechanical colleges, states that the income from these lands shall be used to maintain colleges "where the leading object shall be, without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

The second Morrill Act of Congress, August 30, 1890, making an annual appropriation out of the treasury of the United States for the further support and endowment of these colleges, provides that this fund is "to be applied only to instruction in agriculture and mechanic arts, the English language, and the various branches of mathematical, physical, natural and economic sciences, with special reference to their application to the industries of life; and to the facilities for such instruction."

The Act of the Montana Legislature, approved February 16, 1893 accepts these grants of lands and money and provides that the Montana State College shall have for its object, "Instruction and education in the English language, literature and mathematics, civil and mechanical engineering, agricultural chemistry, animal and vegetable anatomy and physiology, the veterinary art, entomology, geology, and such other natural sciences as may be prescribed by the State Board of Education;

political, rural and household economy, agriculture, horticulture, history, bookkeeping, and especially the application of science and the mechanical arts to practical agriculture in the field, and irrigation and the use of water for agricultural purposes."

THE COLLEGE CAMPUS AND FARM

The grounds and farm contain four hundred acres. Forty acres in the immediate vicinity of the buildings constitute the campus and recreation grounds, which are in lawn, interspersed with flower beds, shrubbery, trees and driveways. The remainder is used for farming and experimental purposes.

BUILDINGS.

Montana Hall is situated in the center of the college campus, a substantial structure of brick and stone, having a total length of one-hundred and twenty-eight feet and width of ninety feet. It is three stories high, and has a basement, which furnishes quarters for mechanical drawing and two class rooms. On the first floor are offices for the president, registrar and secretary, a room for the Young Women's Christian association, a class room, and the south half of the first floor contains the reading room and library, and an office for the librarian. The north half of the second floor is devoted to the art department, the arrangement being such that three large rooms can be thrown together by sliding doors. The south half of the second floor has one office and four recitation rooms. The third floor contains the large assembly hall and seven class and music rooms.

Hamilton Hall is the dormitory for women. It was named by the faculty for the late Mrs. James M. Hamilton. It is one hundred twenty by fifty-eight feet, three stories and basement. It is constructed of brick with hard wood floors and Oregon fir finish. It is equipped with steam heat, electric lights and baths. The rooms are single and in suites, and all rooms have both hot and cold water. In the basement are the store rooms, laundry, quarters for servants, kitchen and large dining room. The first floor contains reception rooms, the dean's suite, guest room and a number of rooms for students. The second and third floors are for students.

Agricultural Hall is a three-story building, one hundred and fifty feet by sixty-eight feet, pressed brick, tile roof, maple floors and modern equipment throughout. The north half of the first floor contains the quarters for dairying, consisting of store rooms, office, class rooms, butter and cheese rooms and laboratories. The south half of this floor is used for horticulture and has seed room, office, class rooms, work room and laboratory. The north half of the second floor is occupied by the agronomy department with office, class room, dry-land office, soil and grain laboratories. In the south half are offices for the director of the experiment station, director of the extension

service, class room, office and laboratory for the department of animal industry. The third floor is devoted to home economics and contains two large kitchen laboratories, a dining room, two class rooms, two sewing rooms, and office.

Adjoining the Agricultural Hall on the south is the greenhouse with iron frame, cement floors, and modern construction throughout. In the center of the front is a palm room thirty-nine feet square and on both sides flower and vegetable rooms twenty-eight by twenty-five feet. Through the center is a plant breeding room ninety-eight by twenty feet and on the west a propagating room ninety eight by nine feet. The entire house is ninety-eight by sixty-eight feet, and joined to the Agricultural building by brick work room, fifty-seven by ten feet.

The Chemistry Building was completely destroyed by fire on October 20, 1916. An appropriation was made by the Fifteenth Legislative Assembly to replace the loss by a modern building, which will be ready for occupancy during the college year of 1917-18.

The Biology Building is three stories with basement, and is brick veneered. On the top floor is a lecture room and a museum containing the zoological collection. On the floor below are three laboratories for bacteriology, botany and zoology, and an office and work room for the botanist. The west half on the first floor is a large laboratory for general biology, and the east half is occupied by the office, library and work room for the entomologist. The basement contains work rooms, class rooms, store rooms, herbarium room, and dark room. Attached to this building on the south is a greenhouse seventy-two by fifty feet, for botanical purposes and an insectary, eighteen by ten feet, for the study of living insects. The greenhouse is divided into two rooms, one for experimental work, and the other for laboratory use.

The Engineering Laboratory is a two-story building, ninety-four by thirty-five feet, with a frame annex thirty-six by twenty feet. The first floor contains the dynamos, motors, and other machinery and apparatus, offices and students' reading room. The second story is occupied by the storage battery, photometer and electric light rooms, class rooms, and offices. The first floor of the annex contains the cement laboratories, and the second floor is used for electrical designing. There is also laboratory space forty-three by one hundred and forty-four feet, occupied by material testing machines, a refrigerating machine, various steam and gas engines, tractors, etc. This last named laboratory also contains a large flume for hydraulic testing and a weir box for determining constants used for various forms of weirs. Adjoining the laboratory on the west is a brick building, seventy-six by thirty-two feet, used as a heating plant for the college.

The Shops contain a forge shop, twenty-seven by sixty feet, a machine shop, forty-four by seventy-two feet, an office, a wash room, and a tool room. It has one wing thirty-six by fifty feet for wood work, and another thirty-six by forty-eight feet for foundry use. The entire building, which is a frame structure is sixty by one hundred feet.

The Gymnasium is a frame building one hundred by sixty feet, has hard wood floor, and on the ends and the sides are permanent seats amphitheater style. It furnishes a convenient place for gymnasium practice, basketball and other indoor athletics. An addition at the rear and sides, ninety by fourteen feet, provides a director's office, two locker rooms, dressing room for women, shower and needle bath rooms, and a material room.

The College Farm Buildings are eight in number, located on the college farm adjacent to the campus. These buildings are the dairy barn, veterinary building, horse barn, beef cattle barn, sheep barn, seed barn and granary, the piggery and poultry plant.

COLLEGE SURROUNDINGS.

Bozeman, the county seat of Gallatin county, is on the main line of the Northern Pacific railroad, and on a branch of the Chicago, Milwaukee and St. Paul railroad. For convenience, healthfulness and beauty of surrounding, the location is unsurpassed. The college is situated on an elevation which commands a view of one of the most fertile valleys in the world, covered far and wide with grain fields, and hemmed in on all sides by lofty mountains.

Bozeman is a city of homes and churches with a wholesome moral environment. It is a most desirable residence city for families who wish to educate their children. Expenses are moderate and there are all of the conveniences of a modern city. The college is reached from the railroad stations and city by the electric car line.

ENDOWMENT.

The Enabling Act, providing for the admission of Montana into the Union, approved February 22, 1889, Section 16, grants ninety thousand acres of land to Montana for the use and support of an agricultural college according to the terms of the Act of Congress, July 2, 1862, and Section 17 grants an additional fifty thousand for the same purpose and subject to the same conditions and limitations as the other grant. The one hundred and forty thousand acres of land cannot be sold for a price less than ten dollars per acre and the principal together with all money received from the sale of timber is to be invested as a permanent endowment. The unsold land may be leased and the rental together with the interest on the permanent endowment shall be used for the maintenance of the college.

The Act of Congress of August 30, 1890, appropriates twenty-five thousand dollars annually out of the Treasury of the United States. By the Nelson Bill passed March 3, 1907, this amount was increased annually by five thousand dollars each year beginning in 1907 and until now the total annual appropriation has reached fifty thousand dollars, at which figure it is to remain.

EXPENSES OF STUDENTS.

Board and Room for Men.

There is no men's dormitory connected with the college. Students who do not have their homes in Bozeman find room and board in private families convenient to the college, for $25 to $30 per month. The total college expenses for the year, including fees, books, room, board and incidental expenses, may be estimated from $275.00 to $375.00. A list of approved places with prices and accommodations is kept in the registrar's office. A committee of students meets all trains on registration days and at other times on request and aids in finding satisfactory locations.

Board and Room For Women.

Hamilton Hall is the college home for women. This building is completely furnished. All modern conveniences, such as hot and cold water in the rooms, baths, steam heat and electric lights, are furnished. The Hall is under the supervision of the dean of women and the residents have the care and training necessary for a family of students. The price of rooms (including board) varies according to location and size of room. Because of the unusual fluctuation of food costs the following prices are subject to change at any time during the year.

One in single room	$27.00
Two in single rooms (each)	25.50
Two in double room (each)	26.00
Two en suite (each)	29.00
Three en suite (each)	27.00

The above prices are for a calendar month. Of these amounts $20.00 is for table board and the remainder for room rent. Application for rooms in the hall may be made at any time to the dean of women, or to the secretary of the college and must always be accompanied by a deposit of $5.00 to insure a reservation. This amount will apply toward payment of bills in the fall or will be returned if the secretary is notified before September 1. Residents who leave the Hall before the close of the semester will be required to pay the room rent till the end of the semester. Payment for room and board must be made on the fifteenth of every month in advance, and after five days thereafter an extra charge of $1.00 per week will be made as long as the bill remains unpaid, unless arrangements have been made to defer payment. Complete arrangements are made for the reception of the residents the day before registration day, and no deduction will be made for late arrivals. The Hall will not be opened for occupancy until the day before registration day. No deduction is made for absences at week ends or during vacations, except at the Christmas holidays, when room rent only will be paid. The residents may have guests at meals by making arrangements for same at the dean's office,

the day before, and may also have the privilege of the laundry on Saturdays by paying a small fee. The residents are expected to furnish their own towel supply, dresser and table scarfs, and have same laundered; also a napkin ring and any room decorations they may fancy.

Railroad Fare Refunds.

In accordance with the provisions of House Bill No. 215 enacted by the Fifteenth Legislaltive Assembly, and under regulations established by the State Board of Education, railroad fare in excess of five dollars actually paid by any student for a round trip between his Montana home and any institution of the University of Montana once each year, will be refunded.

Fees and Deposits.

Note—A fee is a fixed charge and no part is returned. The deposits cover the cost of materials and breakage in the laboratories and any unused balance is returned.

Annual matriculation fee for college and four-years preparatory students	$10.00
Annual student activity fee for college and four-years preparatory students	7.00
Annual matriculation fee for six months course students	6.00
Annual student activity fee for six months course students	5.00
Late registration fee	$2.00 to 4.00
Special fee for removing conditions	2.00

Note—The following fees and deposits are given per semester.

Agriculture.

Number of Course	Fee	Deposit
Agronomy: 1, 11,	$ 1.00	$.50
Agronomy: 2	1.00	1.00
Agronomy: 5	1.00	.00
Animal Husbandry: a, b, c, d, 1, 1a, 2, 2a, 3, 6	1.00	.00
Animal Husbandry: g, h, 11	2.00	.00
Dairy: a, 1, 2,	2.00	.50
Dairy: b, c	1.00	.50
Horticulture: 1	1.50	1.00
Horticulture: 4	5.00	.00
Horticulture: a, 6	1.00	.00
Poultry Husbandry: 46	1.00	.00
Veterinary Science: 51	2.00	.00

Art

Art: a, b, 1, 1a, 1b, 2, 2a, 3, 3a, 4, 7, 7a, 7b, 7c, 8a, 8b, 8c, 9, 15, 16, 18a, 18b	.50	.00
Art: 11, 13	3.00	.00

Number of Course	Fee	Deposit
Art: 12	4.00	.00
Art: 10	6.00	.00
Art: 19	$1.00 to 5.00	.00

Botany and Becteriology.

Botany: c	1.00	.00
Botany: 1	2.00	.00
Botany: 2, 4	3.00	.00
Botany: 3	3.00	3.00
Botany: 11	1.00	4.00
Bacteriology: 12, 14	4.00	3.00
Botany: 15	3.00	2.00

Chemistry.

Chemistry: 1	5.00	3.00
Chemistry: 2, 3, 4, 5, 8, 9, 14, 17, 18	4.00	4.00
Chemistry: 7	6.00	4.00
Chemistry: 11, 12, 22	3.00	3.00
Chemistry: 19	1.50	1.50

Engineering.

Architectural: 1, 4, 10, 11, 14, 15, 16	1.00	.00
Civil: 1, 1a, 2, 4, 9, 28, 29, 30, 39	1.00	.00
Civil: 8, 34, 38	2.00	2.00
Electrical: 4, 6, 10, 12, 14a	1.00	5.00
Mechanical: 2a	1.00	.00
Mechanical: 4, 15a	1.50	.00
Mechanical: 9, 20, 32	2.00	.00
Mechanical: 2b, 21, 27, 28, 34	3.00	.00
Mechanical: 2	5.00	.00

Entomology and Zoology.

Entomology: 4, 5, 6, 7	2.00	.00
Zoology: 1, 2, 3, 8, 12	3.00	.00
Entomology: 10	$2.00 to 10.00	.00

Home Economics

Home Economics: b1, d, j, 7, 8	.50	.00
Home Economics: a, b, 12, 13, 14, 16, 19	1.00	.00
Home Economics: c, h1,	1.50	.00
Home Economics: e, 11, 15, 17	2.00	.00
Home Economics: g, 22	3.00	.00
Home Economics: 1, 5, 6, 23	4.00	.00
Home Economics: 2, 4	5.00	.00
Home Economics: 10	$.50 to 6.00	.00
Home Economics: h, 21	2.50	.00

Mechanic Arts.

Number of Course	Fee	Deposit
Mechanic Arts: d, e, t, q	1.00	.00
Mechanic Arts: f, g, h, j, r, s, u, w	2.00	.00
Mechanic Arts: a	3.00	.00
Mechanic Arts: b	4.00	.00
Mechanic Arts: a1, b1, d1, h1	.00	4.00

Physics.

Physics: a, 1a, 2, 4, 5, 9	1.00	1.00

Secretarial.

Secretarial: 3, 4	1.00	.00

Training for Vocational Teachers.

Trades and Industry: 8, 9, 10, 11, 12	2.00	.00
Trades and Industry: 13	3.00	.00

REQUIREMENTS FOR ADMISSION.

Applicants for admission must be at least sixteen years of age and must present evidence of good moral character.

The completion of a high school or preparatory course of four years is the standard for regular entrance to the freshman class. This must include at least fifteen units of work. The term unit means one subject pursued for at least thirty-six weeks with not fewer than five recitations per week of forty-five or more minutes each. Two periods of laboratory, shop, or drawing work count the same as one recitation.

Applicants for admission without condition to the freshman class are advised to include among the required fifteen units at least the following:

English composition and literature, 3 units.

Mathematics, 2 units.

Science, 1 unit.

History, 1 unit.

Candidates for admission to the school of home economics and mechanic arts and the school of agriculture must have completed the eighth grade in the public schools or its equivalent. There are no set requirements for music and the short agricultural courses, all being admitted who give evidence of being able to profit by the work.

Admission without condition to the courses in engineering requires three years of mathematics and one year of physics.

Admission on Certificates.

Graduates of the accredited high schools of Montana obtain admission by presenting certificates of principals stating subjects taken, time given for each, and grades obtained.

Blanks for such certificates are furnished by the registrar. These should be filed in the registrar's office on or before the first day of registration.

List of Accredited High Schools.

1916-1917.

District High Schools: Alberton, *Anaconda, Baker, Belgrade, Belt, *Billings, Bridger, *Butte, Camas Prairie, *Chinook, Columbia Falls, *Columbus, Conrad, Corvallis, Culbertson, Cutbank, Eureka, *Forsyth, Fromberg, *Glasgow, *Great Falls, *Hamilton, Hardin, Harlowton, *Havre, *Helena, Hysham, Joliet, Laurel, Lavina, Libby, Malta, Manhattan, Moore, Plains, Plentywood, Polson, Pony, Ravalli, Roundup, Ryegate, Shelby, Sheridan, Sidney, Stanford, Stevensville, Terry, Thompson Falls, Three Forks, Valier, Victor, Virginia City, Whitefish, Whitehall, White Sulphur Springs, Worden.

County High Schools: *Beaverhead, (Dillon); Broadwater, (Townsend); *Carbon, (Red Lodge); *Choteau (Fort Benton); *Custer, (Miles City); *Dawson, (Glendive); *Fergus, (Lewistown); *Flathead, (Kalispell); *Gallatin (Bozeman); *Granite, (Philipsburg); Jefferson, (Boulder); *Missoula, (Missoula); *Park, (Livingston); *Powell, (Deer Lodge); *Sweet Grass, (Big Timber); *Teton, (Choteau); Wibaux, (Wibaux).

Private Schools: Academy of the College of Montana, (Deer Lodge); Academy of Montana Wesleyan University, (Helena); Academy of Mount St. Charles College, (Helena); Butte Business College, (Butte); Central High School, (Butte); Loyola High School, (Missoula); Mount Angela Ursuline Academy, (Great Falls); Polytechnic Institute (Billings); Sacred Heart Academy, (Missoula); St. Vincent's Academy, (Helena).

Preparatory work done in other schools than those accredited may receive credit. Applicants from such schools should present certificates, stating the same points as those given from accredited schools. Blanks for this purpose are furnished by the registrar. When the evidence of certificate is not clear and satisfactory, examinations will be given.

Graduates of high schools not in Montana are admitted on certificates without examination, if such high schools are accredited to their own state universities.

*These schools are accredited by the North Central Association of Colleges and Secondary Schools for the year 1916-1917.

Admission on Examination.

Applicants wishing to receive entrance credits on subjects for which they do not present satisfactory certificates are required to take examinations on days prescribed in the calendar. For the academic year 1917-1918 these days are September 11-12 and January 25-26.

Those who are preparing to take entrance examinations should correspond with the registrar for suggestions in regard to such preparation.

Conditional Admission.

The entrance requirement of the completion of a four-years preparatory course with at least fifteen units of credit, may be modified in individual cases by permitting the conditional admission of students otherwise qualified if they are entitled to at least thirteen admission units.

Entrance conditions must be removed within one year from the time of admission. This may be accomplished by private study or tutoring and the passing of entrance examinations; by arranging to take the requisite courses in the regular classes of the Gallatin County High School; or by transferring certain college credit hours and counting them toward entrance standing instead of toward graduation.

Admission of Special Students.

Students twenty-one years of age or older, not candidates for degrees, may be admitted without the usual entrance units, as special students, if they give satisfactory evidence that they are prepared to pursue successfully the special courses desired.

Special students may acquire status as regular students and become candidates for degrees upon complying with the rules of admission and graduation.

Admission to Advanced Standing.

Students entering from collegiate departments of other colleges and universities must bring certificates of honorable dismissal. Upon presentation of the proper certificates they will receive advanced credit for courses taken in institutions of approved standards.

Grades brought by a student from another institution will be accredited in this college only after personal conference with and approval by the head of the department in which credit is desired. Students must present note books for work in which they have had laboratory courses and desire advance credit.

REQUIREMENTS FOR GRADUATION.

Baccalaureate Degrees.

Bachelor's Degree—Candidates for the bachelor's degree must complete satisfactorily one of the college courses. Students who are relieved for any reason of the requirements in military science or physical education shall present four additional credits in some other subjects.

The degree of Bachelor of Science is conferred upon students completing the work prescribed in any one of the college courses and the name of the course taken is placed on the diploma.

In order to complete a course satisfactorily and receive a degree a student must earn as many points as there are credits in the course. In calculating points, A grades count three times as many points as credits allowed for the subject, B grades twice as many points, C grades count the same number of points as credits, and D grades count nothing toward graduation.

All students whose points are two and one-fourth times the number of credits at the time of graduation will receive the degree "With Honors."

For convenience in estimating the requirements for a degree, the following rules are laid down: One hour a week, for a semester, of recitation or lecture work, two or two and one-half hours a week for a semester of laboratory, shop, library work, or drawing, shall count as one credit.

If for any reason the full time is not occupied in the shop, laboratory, drawing room or library, the remainder shall be used under the supervision of the instructor for outside work.

No regular student may take in any one semester, work amounting to less than twelve credits, nor more than nineteen, unless a greater number are prescribed in the course.

Advanced Degrees.

Master's Degree.—The Master of Science degree is conferred only for special attainment in some branch of science. This degree is offered in those departments which give courses leading to a Bachelor's degree. To become a candidate the student must hold a Bachelor's degree from the University of Montana or from another institution of equal rank approved by the committee on graduate studies of the State College of Agriculture and Mechanic Arts. The candidate will be required to meet the following conditions.

1. He shall name the particular branch of science in which he hopes to receive the degree and present evidence of sufficient preparation in this branch.

2. One full year or two semesters of residence study amounting to at least thirty credits of work is required.

3. There shall be a major subject and one or two minor subjects and at least one-half of the work must be done in the major subject.

4. The major work shall be in advance of all under graduate courses in the college but the minor subjects may be selected from among courses pursued for the Bachelor's degree. The minor subjects shall be approved in advance by the committee on graduate studies.

5. The head of the department in which the major work is selected shall be the candidate's class adviser.

6. With the aid of the adviser the candidate shall prepare and submit in writing to the committee on graduate studies, not later than the second week of his resident study, a program of the work which he intends to do as a candidate for this degree. The committee will thereupon report to the candidate and to the faculty its action on the candidacy.

7. The candidate shall present a thesis, which shall be a part of his major work.

8. The candidate will offer himself for examination in his major and minor studies. This examination will be under the supervision of the committee on graduate studies and may be oral or in writing. This committee will appoint a special examining committee.

Engineering Degrees.—The professional engineering degrees, Architectural Engineer, Chemical Engineer, Civil Engineer, Electrical Engineer, and Mechanical Engineer will be conferred upon graduates who present satisfactory evidence of professional work of superior quality extending over a period of not less than three years. Candidates for these degrees will be required to meet the following conditions.

1. The candidate shall submit a record of his professional experience and the subjects of his thesis to the committee on graduate studies, for their approval, not later than January first preceding commencement.

2. He shall present a Bachelor's degree in the same branch of engineering in which he becomes a candidate for the advanced degree.

3. The candidate shall present a satisfactory thesis.

4. He shall offer himself for examination before a committee of the faculty, which shall be appointed by the committee on graduate studies.

All graduate students are required to pay the regular matriculation fee and all course fees. They will not, however, be expected to pay for the student activity fee.

REGISTRATION.

Time for Registration.—The time set for registration of students is the first Tuesday and Wednesday of the first semester, and Friday and Saturday of the second semester. The class room work begins on the first Thursday morning of the first semester and the first Monday morning of the second semester. Students will not be registered on days not listed for registration, except at the convenience of class advisers between four and five in the afternoon. Those who fail to present themselves for registration on the days designated for registration in either semester, will be permitted to register later in the first week, only upon the payment of a special fee of $2.00 in addition to regular fees. Those who apply for registration after the end of the first week of each semester will be registered only upon payment of a special fee of $4.00 in addition to the regular fees. After the third month of the semester the special fee may be remitted upon satisfactory proof that the tardy registration was necessary.

Change of Registration.—A student desiring to change his studies will present his request to his class adviser, who, after consulting all teachers interested, will take such action as he may deem best. A change in course of study is allowed by vote of the faculty only.

Credits Necessary for Re-registration.—It is the sense of the faculty that any student not passing ten credits is wasting his time, and ordinarily he will not be re-registered when he has failed to pass in ten credits the preceding semester.

Registration by Mail.—Most of the details of registration can be arranged in advance by mail, and students are requested to arrange their work so far as possible in this way. Those who enter the institution for the first time should write several days in advance of the college opening, enclosing their credentials, to the registrar of the college, and should state the work which they wish to take. These documents will be examined and the student's classification ordinarily be determined before his arrival, so that much time in registration may be saved. Those who have been already enrolled in the institution should send a letter to their class adviser several days in advance of the registration days, telling clearly the work which they plan to take, and in case of elective subjects, stating briefly the reasons for their choice.

If these steps are taken by students, registration should be completed with a minimum expenditure of time; but no student's registration will be complete until he applies at the college in person.

Students who plan to arrange their registration by mail, as specified above, should study carefully the entrance requirements for the courses in which they are interested, and the prerequisites to the various subjects which they wish to take.

MISCELLANEOUS INFORMATION.

Scholarship and Attendance.

Government.—Students are expected to conduct themselves as ladies and gentlemen; those who fail to comply with this demand will be requested to leave the institution.

Leave of Absence.—When it is necessary for a student to be absent from the city, application must be made to the president for leave of absence. A leave of absence is justification for absence from class, but does not give relief from the work omitted.

Honorable Dismissal.—Students intending to sever their connection with the institution, either indefinitely or permanently, should report as soon as possible to the president either in person or writing, giving proper explanation, and should apply for an honorable dismissal. Students leaving the institution without such honorable dismissal (except at the end of the college year), will not be readmitted to the college at any later time, nor will any report or grades in credit for work done here be sent out until satisfactory explanation is made.

Passing Grades.—Passing grades are marked A, B, C, or D. An average standing from 90 to 100 is A, from 80 to 90 is B, from 70 to 80 is C, and from 60 to 70 is D.

Conditions and Failures.—Work not of a passing grade shall be marked E, if in the judgment of the instructor it can be made up or completed without repeating the course in class. Work not of a passing grade shall be marked F, if in the judgment of the instructor it cannot be made up or completed without repeating the course in class. A mark of E is a condition and may be removed by an examination or in such other manner as the instructor may prescribe. Examinations for removing conditions shall be held on the days designated in the college calendar. A mark of F is a failure and must be made up by repeating the subject in class. When a condition is not removed by the time the subject is offered the following year it lapses into a failure. The above marks apply to laboratory, shop work, drawing and other exercises, as well as to lecture and recitation courses.

Students whose work is unsatisfactory will be reported to the class adviser and the president, and information will be sent to the parents or guardians.

Absences.—Students absent from required exercises are reported at the close of each day to the registrar's office. On each Monday morning, there are posted on bulletin boards, the names of those students who are to appear before the absence committee. The committee, or one of its number, meets each Monday afternoon at

4 o'clock in the office of the registrar, and deals with the cases of students whose names have been listed for consideration. In the case of frequent, unwarranted absences, the committee shall bring the case before the faculty for discipline. These regulations apply to all students in the institution below the grade of junior.

Class absences of juniors and seniors will not be reported until the instructor feels that members of these classes are wilfully remaining away from class and so wasting their time, and then these are to be reported to the absence committee for consideration and to the faculty for discipline. The instructors deal with tardiness in such manner as they deem best.

Assembly.—Students are required to attend the assemblies held on each Friday during the college year, and all special assemblies. The programs of these assemblies consist of addresses, music, recitals, illustrated lectures, etc.

Employment and Aid for Students.

A number of students earn a part of their expenses while in college. Students expecting to work their way should come with sufficient money to pay their expenses for one semester unless they have engaged work in advance. The college cannot guarantee employment but those who are willing to give efficient faithful service have usually found work.

A few students are employed as janitors and assistants in the shops, laboratories and barns. Others care for furnaces, horses and cows in the city, work in stores and at various kinds of house work. Calls for young lady students to work for their board are numerous.

Students readily find employment at profitable wages during the summer vacation.

Engineering students are placed with the reclamation service, the railroads, and the electric power plants.

STUDENT ORGANIZATIONS.

Young Women's Christian Association.

The association is undenominational and is well fitted to promote the moral and religious life of students. It conducts mission and Bible study courses and prayer meetings, and secures addresses by religious workers. The association promotes good fellowship by giving social entertainments, assists new members to get started in college life and aids in securing employment for those who wish to work their way through college.

Young Women's Christian Association

The object of this association is the symmetrical development of Christian womanhood and the rendering of social service. To this

end it conducts devotional meetings, Bible and mission study classes, and carries on an employment bureau for college women; homes are found where college women may receive their board and room in return for their services. This work is being standardized and will be supervised by the home economics seniors of the Y. W. C. A. The Y. W. C. A. cooperates with the Y. M. C. A. in social and religious work among the students. Each year it sends delegates to the Northwest Conference and keeps in touch with the state, national and international associations.

Debating.

The management of the work in inter-class and inter collegiate debating, in extemporaneous speaking, and in oratory, is now vested in the manager appointed by the Associated Students, and the Coffee Club, which works in cooperation with the department of English. There is an established debate each year between the freshman and sophomore classes. There is a state contest in oratory and extemporaneous address and several intercollegiate debates.

The Exponent.

The students of the college maintain an excellent weekly paper, The Exponent. The paper is well supported by the students and outside advertisers and has become one of the most important and successful of student enterprises. It compares favorably with the best college publications in the United States and affords the members of the staff very valuable literary training.

Athletic Council.

This organization, composed of representatives from the faculty, alumni association and student body has general control over all branches of athletics. Football, basketball, baseball, track and tennis are at present recognized.

Branch of the American Institute of Electrical Engineers.

A branch of this society is maintained at the college. Regular monthly meetings are held at which original papers are read or those of the Institute discussed. Students and teachers are kept in touch with practical engineers and their problems. Only regular members or student members of the American Institute are eligible to membership in this branch. There is, however an Electrical Club, which includes all the members of the Institute and all other students in the electrical engineering course.

The Civil Engineering Society.

The students of the department of civil engineering organized this society for the purpose of promoting their interests in matters of practical importance to engineering students and alumni. Promin-

ent engineers who have succeeded in special fields frequently meet with the members of the society to discuss the problems of their field. Meetings are held bi-monthly.

College Band.

The college band, of forty-five members, is one of the best amateur musical organizations in the state. The college provides instruments, music and instruction. The band is divided into two sections, beginners and experienced players. This gives a splendid opportunity for those who have never played and those who have some skill in the use of instruments. One half credit per semester is allowed those who register in band.

Glee Club.

Men are admitted upon examination as to musical qualifications and the membership is limited to about sixteen. Instruction and music are furnished free by the music department. Both popular and high class works are studied. One half credit per semester is allowed those who register in glee club.

Treble Clef Club.

This club for young women corresponds in scope and work to the men's glee club. Membership is limited to about twenty and it is also under the direction of the music department. Both clubs appear at college functions and recitals during the year. One half credit per semester is allowed those who register in this club.

Orchestra.

The orchestra is an organization composed of students of the college. The membership numbers about twenty and the club meets twice a week for practice. Some light symphonies are worked out by the orchestra during the year.

Agricultural Society.

All agricultural students are eligible to membership in this society. Regular meetings are held for the discussion of topics of interest in scientific agriculture with special reference to the possibilities of farm life.

Home Economics Club.

This club is composed of women students who are working for a degree in home economics. Meetings are for the discussion of topics of interest to students in home economics and also to keep in touch with the work of the alumni of this department.

The Chemical Society.

The students taking the chemistry course join this society for the purpose of developing an interest in the professional side of the subject and also for studying topics that do not come up in regular class work. Regular meetings are held and abstracts of recent journal articles are presented.

The Alumnae Club.

The active members of this organization are women graduates, residing in or near Bozeman; the associate members are the undergraduate women. The object of the club is to promote the interests of college women.

Associated Students.

An organization consisting of the whole body of students of the institution. The society is organized to manage all matters of general interest to students as athletics, debates, oratory, and entertainments.

Fraternities, Sororities, and Social Clubs.

There are three fraternities which are, as yet, only local organizations, the Omega Beta with a house on South Sixth avenue, the Delta Chi with a house on South Third avenue, and the Kappa Nu who maintain a house on South Grand avenue. There is also a club for men known as Les Bouffons. There is one national sorority, the Alpha Omicron Pi, a local sorority, the Phi Gamma who have a house on Tracy avenue, and a social club known as the Triple "S." Fraternities, sororities and social clubs like other student organizations, are under the supervision of the faculty.

SCHOLARSHIPS AND PRIZES.

High School Honor Scholarships
For the Year 1916-1917.

In order to promote the attendance of students of ability and promise upon the several institutions of the University of Montana it is the declared policy of the State Board of Education to provide for the awarding of scholarships to be known as "High School Honor Scholarships" to graduates of the accredited public high schools of the state.

In the administration of this policy the number of scholarships awarded each year in any accredited high school will depend upon the number of graduates, as hereinafter specified. In no case, however, will more than two such scholarships be awarded each year in any high school for any one of the institutions of the University. High School Honor Scholarships may be awarded only to students who belong to the highest one-fourth of the graduating class in scholarship.

The following general regulations will govern the awarding of High School Honor Scholarships:

1. Upon the presentation of the required certificate from the principal; the Chancellor of the University will authorize the award each year to graduates of each of the accredited public high schools of the state High School Honor Scholarships from the component institutions of the University of Montana.

2. To be eligible for a High School Honor Scholarship the individual must be certified by the principal:

(a) To be a graduate of an accredited high school of the state;

(b) To belong to the highest one-fourth of his class in scholarship; and,

(c) To be a student of ability and promise of success in college or professional school.

3. No graduate shall receive a High School Honor Scholarship unless he shall have belonged in scholarship rank to the highest one-fourth of his class. No more than one scholarship may be awarded to the membership of any graduating class having seven or fewer graduates; no more than two scholarships may be awarded to the membership of any graduating class having eight to eleven graduates; no more than three scholarships may be awarded to the membership of any graduating class having twelve to fifteen graduates; no more than four scholarships may be awarded to the membership of any graduating class having sixteen or more graduates.

The High School Honor Scholarship of any year for any one of the University institutions shall be awarded to that eligible graduate standing highest among those desiring to attend that institution.

4. The holders of High School Honor Scholarships shall be exempted from the payment of all customary fees, except the student activity fees and special tuition fees in the schools of law and music. All holders of High School Honor Scholarships will be expected to make the required course deposits.

5. Any High School Honor Scholarship will become void unless the holder enters one of the institutions of the University within eighteen months after graduation from the high school. The holder of a High School Honor Scholarship must give notice to the registrar of the institution of his intention to utilize the scholarship, not later than September 1 of the year in which he intends to enter the institution.

6. Any High School Honor Scholarship will be valid as long as the holder is in attendance upon some regular course leading

to graduation: provided, however, that no High School Honor Scholarship shall be valid for a period longer than five years.

7. In case any individual to whom has been awarded a High School Honor Scholarship relinquishes the scholarship without entering the institution, or for any reason fails to enter the institution in compliance with Section 5 of these regulations, the high school principle may certify the next ranking elegible member of the same graduating class desiring to enter the particular institution.

8. The privileges of a High School Honor Scholarship may be retained only so long as the holder maintains a standard of scholarship and regularity of attendance satisfactory to the faculty of the institution at which he is in attendance.

Military Service Scholarships.

Upon the proper certification of the president that a student has been a member of the Second Montana Infantry and rendered service with that regiment on the Mexican border and has been honorably discharged, the Chancellor of the University of Montana will authorize the award of a Military Service Scholarship to such student. The holders of such scholarships, throughout their course, will be exempt from the payment of all regular fees, but not laboratory deposits or special course tuitions.

Federation Scholarship.

The State Board of Education grants to the Montana Federation of Woman's clubs a scholarship in each of the four state colleges each year. The Federation pays all college expenses of the woman elected, including board, room rent, books, student activity ticket and gymnasium suit.

Y. W. C. A. Scholarship.

Every four years the Y. W. C. A. offers a scholarship to a woman high school graduate who might otherwise be unable to attend college. Selection of a woman is made from among the applicants on the basis of character and scholarship. The woman elected is given her fees, books, and student activity ticket, and a good home is found where she may work for her room and board.

Prize in Oratory.

An annual prize of twenty dollars is given to the winner of the annual local oratorical contest. This is open to all students. The winner represents the college in the state oratorical contest.

Armstrong Prize in Declamation.

Hon. F. K. Armstrong of Bozeman, gives a prize of ten dollars to the winner of the annual declamatory contest of the secondary

schools. There is also a second prize of five dollars. Only regular students are eligible.

Story Prize in Extemporaneous Speaking.

Hon. Nelson Story, Jr., gives an annual prize of twenty-five dollars toward an Extemporaneous Speaking Contest. Fifteen dollars is given as first prize, and ten dollars as second prize. This contest is open to all regular students of the secondary schools.

ATHLETICS.

The gymnasium furnishes a convenient place for gymnasium practice, basketball and other indoor athletics. There are dressing rooms for both men and women, shower and needle bath rooms, and a material room. On the campus are located a quarter mile cinder track, a baseball diamond, a football field, and three cement tennis courts.

Eligibility for Athletics.

The rules governing eligibility of players shall be the same for all athletic contests in which any team plays an officially scheduled contest under the name of the college, whether the game be with another college, a club, or a secondary school. Each student representing this institution in an intercollegiate contest must be eligible according to the Rocky Mountain Faculty Athletic Conference rules.

Basketball Tournament, Speaking Contest, and Essay Contest.

The annual high school basketball tournament, speaking contest and essay contest are held on Wednesday, Thursday, Friday, and Saturday nearest the tenth of March. An invitation is extended to the sixteen high school basketball teams, who have, during the basket ball season proven their superiority in competition with other teams. Appropriate school trophies are presented to the best teams, and suitable individual awards are given to the team members. In connection with the tournament an extemporaneous speaking contest, and an essay contest are held.

LIBRARY AND READING ROOMS.

Main Library.

The library occupies the south half of the first floor of Montana Hall. It contains 15,432 volumes, not counting public documents, and about 6,000 pamphlets. It is well supplied with standard works in technology, history, science, and literature, as well as with dictionaries, cyclopedias and other reference works.

By Act of Congress the library is now a depository and receives

all public documents and other printed matter issued by the United States government.

Department Libraries.

The agricultural library occupies two rooms of the first floor of the Agricultural Hall. It contains almost complete bound sets for all state experiment station bulletins and United States Department of Agriculture publications, besides a large number of agricultural papers and standard works. One room on the first floor of the biology building is used for the library and periodicals of the biological department.

STUDENT LOAN FUNDS.

General University Student Loan Fund.

The Montana Bankers' Association, and the Alumni of the University of Nebraska residing in Montana, have each established funds which are available for students in the junior and senior classes of any of the institutions of the University of Montana, who are unable to continue their studies without financial aid, and are satisfactorily recommended as to character and scholarship by the dean or director, or the head of the department in which the applicant's major work is done. The loan to any one student is limited to two hundred dollars during his course, and not more than one hundred dollars in any one year. Loans must be repaid within one year from the time of borrowing, or in exceptional cases, one year after graduation. Loans bear two per cent interest.

Application blanks and a statement of detailed regulations governing these loans may be obtained from the registrar.

State College Loan Fund.

The Loan Fund Committee of this College makes every effort to assist worthy students who are in need of funds. Seniors and junior college students may apply to this committee for a loan.

Whenever possible, students who apply for a loan are aided to find work in order that they may earn the money required for their support.

EXPERIMENT STATION.

Associated with the State College is the Montana Agricultural Experiment Station. This station was established by an act of Congress, (Hatch Act), passed in 1887 and supplemented by another act, (Adams Act), passed in 1906. By these two acts $30,000.00 per year is given to the state.

In the words of these Congressional acts, the purpose of these appropriations is given as follows:

"It shall be the object and duty of said Experiment Stations to conduct original researches and verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as persued under the varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test the comparative effects on crops of different kinds; the adaptation and value of grasses and forage crops; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective states and territories."

These acts define and limit the work of the Agricultural Experiment Station. It must be directed towards the solving of the practical agricultural problems of the state and making that industry more profitable to those engaged in it.

These appropriations from the Federal Government have been supplemented by State appropriations, which this year amount to $60,000.00 for the central station and $18,000.00 for the sub-stations.

The work covered by the Experiment Station is indicated by the ten departments of work, which are as follows:

Agronomy, Animal Husbandry, Poultry, Horticulture, Farm Management, Agricultural Engineering, Chemistry, Entomology, Botany and Bacteriology, and Veterinary.

The Experiment Station farms consist of about 260 acres of irrigated land adjoining the campus and the Ft. Ellis farm of about 600 acres of non-irrigated land, some four miles out. Well equipped laboratories are also provided for the various departments, while all the farm buildings are arranged so as to facilitate the experiments with live stock. The equipment and facilities of the Experiment Station are available to a limited number of students for graduate work.

The great variations in the climate of the state make necessary the establishment of sub-stations to study the crop possibilities of various sections of the state. At present four such stations are in operation, viz. In the Judith Basin near Moccasin; in the Yellowstone Valley near Huntley; in Northern Montana near Havre and in the Bitter Root Valley near Corvallis. The latter sub-station is for the study of fruit and garden crops only. While not covering all the climatic regions of the state these substations afford opportunity for the more complete study of the state's agricultural possibilities and particularly of the crops adapted to particular sections of the state.

The results of the studies and observations made by the Station Staff are published in bulletins, circulars, leaflets, posters, etc. They are distributed free of cost to the people of the state who apply for them. Those who would like to receive the publications as issued may have their names placed on the permanent mailing list and receive the bulletins as soon as issued. Write to The Agricultural Experiment Station, Bozeman, Montana.

AGRICULTURAL EXTENSION SERVICE.

The purpose of agricultural extension service is to take agricultural science and experience out to farms and farm homes for the assistance of the people. The fruits of experiment and research; the formulated sciences of agriculture, biology, chemistry, physics and home economics as applied to country life, and the best farm experience are the foundation for this extension teaching. These are construed broadly to include the economic, business, social, educational, aesthetic, and ethical as well as strictly productice phases of country life. Home economics and household arts are included with agriculture in this extension service.

From a beginning with a single officer in charge of extension service and temporary assistance secured from the college, experiment station, and outside sources a permanent division has been created with a director and an office force, and with field assistants who are specialists in animal husbandry, home economics, horticulture, agronomy, rural education. To this staff of extension workers for statewide service is being rapidly added a corps of county demonstrators in agriculture and home economics, whose work is personal and direct within a limited territory. These county demonstrators are working concertedly under direction of the State extension office in cooperation with the Federal agricultural organization. Members of the college faculty and experiment station staff devote a considerable time to extension service.

The extension equipment at present consists chiefly of a comprehensive agricultural library, stereopticon slides, charts, Babcock testers, and other illustrative and demonstrative material. For extension service in schools, at fairs, on better farming trains and elsewhere, the resources of the college and experiment station are freely drawn upon. Livestock, machinery, scientific apparatus, as well as agricultural, biological and chemical collections, are available for such instruction.

Among the more important lines of extension work are:

I. Farmers' Institutes: Meetings of farm people addressed by speakers of established reputation, for purposes of instruction and inspiration.

II. Correspondence: Instruction by mail, through the press, and by reading and correspondence courses. Reading matter con-

taining information of current interest along the lines of agriculture and home economics is sent weekly to all the papers of the state.

III. Movable Schools: Located for the convenience of farmers for systematic instruction by qualified teachers. The schools each have the services of from four to six instructors and their average duration is one week.

IV. Better Farming Trains: Operated in cooperation with railroad companies. These trains carry several cars of illustrative and demonstrative material, and corps of fifteen to twenty instructors.

V. Fairs: The educational value of the country fair is being enhanced by trained judges furnished by the extension office and by demonstration exhibits.

VI. High School Lectures and Lecture Courses: Seventy-five to one hundred lectures in applied science given yearly to Montana high schools. Their purpose is to give instruction in agriculture, home economics, and applied science, adapted to pupils of secondary grade.

VII. Rural Education: Assisting the present educational system in coordinating rural education with country life, introducing agriculture into the rural curriculum, and enhancing the value of country schools.

VIII. Industrial Clubs: These engage boys and girls in partical enterprises, such as corn contests, potato contests, sewing contests, canned fruit contests, etc. The winners in these county contests are taken to the state fair and entertained and taught under the supervision of college officers.

IX. County Agriculturists: In Cooperation with the Federal government and counties of the State, agents are located to assist farmers personally in solving local problems of production, marketing, and country life. The extension service seeks to coordinate all forces that are at work for rural betterment, whether industrial, business, educational, social, or religious, and to cooperate with them for the greatest efficiency in such service.

ENGINEERING EXTENSION SERVICE.

The College of Engineering Extension Service has been inaugurated in order to give engineering instruction to those who desire information along engineering lines and who have not the time or the opportunity to attend the college. The courses, arranged so as to aid those engaged in practical work, consist of lectures, discussions, recitations, drawing, etc. When a sufficient number apply for one or more courses, classes are organized and an engineering instructor visits the classes, once a week, to lecture or to conduct

class recitations. In this way the student comes in direct contact with the instructor. Among the courses offered are the following.

1. **Shop Calculations.** Calculations of shop problems; size of gear, pulleys, etc.

2. **Drawing Course** 1. Instruction in the use of instruments, lettering and projections.

3. **Drawing Course 2.** Development of surface and the drawing of simple machine parts.

4. **Design of Simple Structures.** Determination of stresses in simple structures, including the design of a simple truss in wood and steel. Especially adapted to the needs of carpenters, builders and contractors.

5. **Valve Gears.** A study of valve movements as applied to locomotives and other engines. The Zeuner diagram.

6. **Electrical Machinery.** Direct currents, a study of the construction and operation of direct current machinery.

7. **Electrical Machinery.** Alternating currents, a study of the construction and operation of alternating current machinery.

8. **Heat and Steam.** Nature of heat, use of steam table, efficiency of the perfect engine, compounding, jacketing, superheating.

9. **Internal Combustion Engines.** Gas, gasoline and producer gas engines, gas producers.

Organization of Instruction.

A. The following four-year college courses, each leading to the degree of Bachelor of Science, are offered:

1.—College of Agriculture.
- (1) Agronomy.
- (2) Animal Husbandry.
- (3). Dairy Husbandry.
- (4) Horticulture.

2.—College of Engineering.
- (1) Architectural Engineering.
- (2) Chemical Engineering.
- (3) Civil Engineering.
- (4) Electrical Engineering.
- (5) Irrigation Engineering.
- (6) Mechanical Engineering.

3.—College of Applied Science.
- (1) Botany and Bacteriology.
- (2) Chemistry.
- (3) Entomology and Zoology.
- (4) Industrial Chemistry.

4.—College of Household and Industrial Arts.
- (1) Applied Art.
- (2) Home Economics.
- (3) Secretarial Work.

5.—Courses for Vocational Teachers.
- (1) Agricultural Education and Extension Methods.
- (2) Teachers' Course in Home Economics.
- (3) Teachers' Course in Trade and Industry.

B. The following courses, not leading to a Bachelor's degree are offered:

1.—Graduate Course for Nurses.
2.—School of Agriculture.
3.—School of Mechanic Arts.
4.—Secretarial Work.
5.—School of Home Economics.
6.—Summer Session.

College of Agriculture

This college includes four courses, viz, Agronomy, Animal Husbandry Dairy Husbandry and Horticulture. For the first two years the work is the same in all three courses. At the beginning of the junior year the student chooses the group in which he desires to specialize. The aim of this work is to give a thoroughly practical course based on a broad, scientific foundation, along the lines of field agriculture, horticulture, livestock, dairying and poultry.

The Agricultural Course is based on the assumption that the students are familiar with the manual operation of farm work. All students should have at least one year's farm experience before entering the course. In any case, students must furnish satisfactory evidence of having spent six months in practical work on a farm before graduation.

The college is very completely equipped for agricultural instruction. A large agricultural building, thus centralizing the work, a one thousand acre farm, a large orchard and garden, large and well equipped laboratories for the study of soils, and crops, for milk testing and dairy manufacturing and for the study of farm machinery, a large greenhouse well stocked with plants, and several barns and other buildings filled with various breeds of livestock, including beef and dairy cattle, horses, sheep, hogs, and poultry—all these are at the command of the agricultural student.

COURSE IN AGRICULTURE.

FRESHMAN YEAR.

First Semester.		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
General Botany (Bot. 1)	5	Agricultural Physics (Phys. 1a)	5
Trig. and Log. (Math. 2a) or Ele. Analysis (Math. 7)	3	Prin. Plant Production (Hort. 1)	3
Live Stock Judging (An. Husb. 1)	2	Live Stock Judging (An. Husb. 1a)	2
History of Agriculture (Agron. 12)	1	History of Agriculture (Agron. 12)	1
Military Science (Mil. Sci. 1)	1	Military Science (Mil. Sci. 2)	1
	19		19

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2	Expository Composition (Eng. 2)	2
Organic Chemistry (Chem. 5)	4	Agricultural Chemistry (Chem. 7)	5
Field Crops (Agron. 1)	4	Forage Crops (Agron. 11)	4
Fruit Grow. and Garden. (Hort. 10)	4	Farm Dairy (Dairy 1)	3
Invertebrate Zoology (Zool. 1)	4	Vet. Physiol. and Anat. (Vet. Sci. 51) or Entomology (Ento. 4)	4
Military Science (Mil. Sci. 3)	1	Military Science (Mil. Sci. 4)	1
	19		19

COURSE IN AGRONOMY.

JUNIOR YEAR.

First Semester.		Second Semester	
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Soil Physics (Agron. 2)	5	Soil Fertility (Agron. 3)	3
Bacteriology (Bact. 12)	4 or 5	Plant Physiology (Bot. 3)	4
Breeds of Livestock (An. Husb. 2)	3	Organic Evolution (Zool. 9)	3
Elective	5 or 4	Breeds of Livestock (An. Husb. 2a)	3
		Elective	4
	19		19

SENIOR YEAR.

Farm Management (Agron. 6)	4	Soil Management (Agron. 8)	2
Principles of Breeding (Agron. 7)	4	Adv. Grain Judging (Agron. 5)	2
Farm Records and Accts. (Agron 10)	2	Farm Mechanics (Agron. 4)	3
Elective	9	Plant Pathology (Bot. 4)	4
		Common Diseases (Vet. Sci. 57)	4
		Elective	4
	19		19

COURSE IN ANIMAL HUSBANDRY.

JUNIOR YEAR.

First Semester.		Second Semester.	
Economics (Econ. 3)	2	Economics (Econ. 3))	2
Breeds of Live Stock (An. Husb. 2)	3	Breeds of Live Stock (An. Husb. 2a)	3
Bacteriology (Bact. 12)	4 or 5	Nutr. of Farm Animals (An. Husb. 4)	3
Soil Physics (Agron. 2)	5	Common Diseases (Vet. Sci. 57)	4
Elective	3 or 4	Handling and Fitting of Live Stock (An. Husb. 11)	1
		Elective	5 or 6
	18 or 19		18 or 19

SENIOR YEAR.

Beef Cattle and Sheep Prod. (An. Husb. 7)	4	Horse, Swine and Dairy Cattle Prod. (An. Husb. 8)	4
Adv. Stock Judging (An. Husb. 3)	1	Breeding Farm Animals (An. Husb. 6)	3
Principles of Breeding (Agron. 7)	4	Farm Mechanics (Agron. 4)	3
Farm Management (Agron. 6)	4	Elective	8 or 9
Sanitary Science (Vet. Sci. 56)	2		
Elective	3 or 4		
	18 or 19		18 or 19

COURSE IN DAIRY HUSBANDRY.

JUNIOR YEAR.

First Semester.		Second Semester	
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Breeds of Live Stock (An. Husb. 2)	3	Breeds of Live Stock (An. Husb. 2a)	3
Bacteriology (Bact. 12)	4 or 5	Nutr. of Farm Animals (An. Husb. 4)	3
Dairy Management (Dairy 6)	2	Creamery Butter Making (Dairy 3)	4
Inspection of Milk Products (Dairy 2)	2	Market Milk (Dairy 5)	3
Elective	4 or 5	Elective	3 or 4
	18 or 19		18 or 19

SENIOR YEAR.

Farm Management (Agron. 6)	4	Sociology (Soc. 4)	3
Sanitary Science (Vet. Sci. 56)	2	Obstetrics (Vet. Sci. 54)	2
Cheese Making (Dairy 4)	4	Factory Management (Dairy 8)	3
Milk Production (Dairy 7)	2	Dairy Technology (Dairy 10)	3
Seminar (Dairy 9)	1	Seminar (Dairy 9)	1
Elective	5 or 6	Elective	6 or 7
	18 or 19		18 or 19

COURSE IN HORTICULTURE.

JUNIOR YEAR.

First Semester.		Second Semester	
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Soil Physics (Agron. 2)	5	Soil Fertility (Agron. 3)	3
Bacteriology (Bact. 12)	4 or 5	Plant Physiology (Bot. 3)	4
Systematic Pomology (Hort. 4)	3	Organic Evolution (Zool. 9)	3
Elective	4	Coml. Vegetable Garden (Hort. 11)	3
		Elective	3 or 4
	18 or 19		18 or 19

SENIOR YEAR.

Coml. Fruit Growing (Hort. 7)	3	Landscape Gardening (Hort. 6)	3
Plane Surveying (C. E. 1a)	3	Greenhouse Const. and Management (Hort. 5)	3
Prin. of Breeding (Agron. 7)	4	Plant Pathology (Bot. 4)	4
Elective	8 or 9	Elective	8 or 9
	18 or 19		18 or 19

College of Agriculture

COURSES OF INSTRUCTION.

Note—Animal husbandry and dairy husbandry students will take veterinary anatomy and physiology (Vet. Sci. 51), and agronomy and horticultural students will take entomology (Ento. 4).

The Roman numeral I and II designate the semester in which the course is given. When the course is continuous through the year, the abbreviation, "Yr." is used.

AGRONOMY.

PROFESSORS, A. ATKINSON, F. B. LINFIELD (Dean). ASSISTANT PROFESSORS, W. O. WHITCOMB, E. L. CURRIER, H. E. MURDOCK, L. F. GIESEKER.

The agronomy course is designed to afford special training in the production of field crops, the cultivation of soils, the maintenance of soil fertility, the management of farms, and the use of machinery and power for doing the work on the farm. The aim in this work is to fit men to intelligently deal with the many problems arising in the development of western agriculture under dry land and irrigated conditions.

The facilities provided for agronomy instruction include suitably equipped crops and soil laboratories, the crops and materials of the college farm and experimental fields and of the State Grain Laboratory, farm management survey records of over one thousand farms in Montana which represent different systems of management and an equipment of engines, tillage, seeding and harvesting machinery especially provided for instructional purposes.

For Undergraduates.

1. Field Crops. I; 4 cr. Prerequisite Botany 1. Fee $1. Deposit $.50. Mr. Whitcomb

History, characteristics, uses and methods of growing and handling wheat, oats, barley, corn, flax, and other cereals; judging of grain and use of the grain score card. Lect. 2; lab. 2.

2. Soil Physics. I; 5 cr. Prerequisites Physics 1a, Chemistry 5. Fee $1; Deposit $1.Mr. Whitcomb, Mr. Gieseker.

Soil and its cultivation in relation to growth of crops; origin and formation of soils; soil classification and influence of tillage methods of soil moisture, texture, temperature and aeration. Lect. 3; lab. 2.

3. Soil Fertility. II; 3 cr. Prerequisites Chemistry 7, Bacteriology 12. Mr. Gieseker.

Maintenance of fertility; use and influence of fertilizers and crop rotations on the productive capacity of the soil. Lect. 3.

4. Farm Mechanics. II; 3 cr. Prerequisites Physics 1a, Agronomy 1, 2. Mr. Murdock.

Development, construction, functions and methods of operating, adjusting and repairing implements, farm machinery and farm motors. Lect. 2; lab. 1.

5. Advanced Grain Judging. II; 2 cr. Prerequisite Agronomy 1. Fee $1. Mr. Whitcomb.

Study of cereal, grass and forage seeds with practice judging. Commercial grading of grain. Lab. 2.

6. Farm Management. I; 4 cr. Prerequisites Agronomy 1, 2. Mr. Currier.

In this course are taught the fundamental principles involved in the efficient organization and management of a farm business. Lect. 3; lab. 1.

7. Principles of Breeding. I; 4 cr. Prerequisite Zoology 1. Mr. Atkinson.

Variation, biometry, heredity, selection, mutations, hydridization, reversion and prepotency as applied to plants and animals; methods used in improvement of plants. Lect. 4.

8. Soil Management. II; 2 cr. Prerequisites Agronomy 1, 2. Mr. Whitcomb.

Methods of handling alkali, gumbo, sandy, heavy clay, muck, peat and worn-out soils; soil problems of irrigated and dry farms. Lect. 2.

9. Thesis. Yr.; 4 cr. Mr. Atkinson.

Senior agronomy students may prepare a thesis on some subject approved by the head of the department not later than November 15.

10. Farm Records and Accounts. I; 2 cr. Mr. Currier.

Keeping and interpreting farm accounts. Open to juniors and seniors in the College of Agriculture. Lect. 1; lab. 1.

11. Forage Crops. II; 4 cr. Prerequisite Agronomy 1. Fee $1; Deposit $.50. Mr. Whitcomb.

History, characteristics and methods of management of grasses, clovers and other crops where the entire plant is cut for hay or used for silage, pasturage or soiling. Lect. 3; lab. 1.

12. History of Agricultue. Yr.; 2 cr. Mr. Linfield. Lect. 1.

ANIMAL HUSBANDRY.

Professor, C. N. Arnett, Assistant Professors, R. C. McChord, W. E. Joseph, Mr. Tretsven.

The course in animal husbandry covers the various phases of live stock production, such as judging, selection, breeding, feeding,

care and management for both farm and range conditions.

The aim is to give the student a thorough training in practical and scientific live stock production. The work in judging begins with score card practice and leads to judging groups. Feeding is based upon scientific principles and made as practical as possible. Study of pedigrees and breeding records give a knowledge of the most desirable families or strains within the different breeds and point the way to live stock improvement.

This course aims to give a scientific and practical training that fits the student for work in practical and scientific stock farming, also work in teaching and research work in animal husbandry in the various fields.

The department of animal husbandry in the college and experiment station maintains a number of the leading breeds of live stock for use in the class room. This equipment consists of several types of horses; Hereford, Shorthorn, Holstein, and Jersey cattle; Berkshire, Poland China, Duroc Jersey and Yorkshire swine; Cotswold Shropshire and Rambouillet sheep; and several of the leading breeds and types of poultry.

The experiment station also maintains a large number of high grade animals for experimental work that are available for study and offer many practical demonstrations in feeding and management.

The equipment of barns, silos, etc. are of modern plan and construction and afford an excellent opportunity for study.

For Undergraduates.

1. Live Stock Judging. I; 2 cr. Fee $1. Mr. McChord.

Beef cattle and sheep. Scoring individuals, judging groups, live stock markets and market classification. Lab. 2.

1a. Live Stock Judging. II; 2 cr. Fee $1. Mr. McChord.

Horses, swine, and dairy cattle. Scoring individuals, judging groups, live stock markets and market classification. Lab. 2.

2. Breeds of Live Stock. I; 3 cr. Prerequisite Animal Husbandry 1. Fee $1. Mr. McChord.

Origin, history, characteristics and adaptability of beef cattle and sheep; judging breed type. Lect. 2; lab. 1.

2a. Breeds of Live Stock. II; 3 cr. Prerequisite Animal Husbandry 1a. Fee $1. Mr. McChord.

Origin, history, characteristics and adaptability of horses, swine, and dairy cattle; judging breed type. Lect. 2; lab. 1.

3. Advanced Stock Judging. I; 1 cr. Prerequisites Animal Husbandry 2, 2a. Fee $1. Mr. McChord.

Continuation of judging and study of market and breeding stock. Beef cattle, sheep, horses, swine and dairy cattle. Lab. 1.

4. Nutrition of Farm Animals. II; 3 cr. Prerequisite Chemistry 5. Mr. Joseph.

Digestion, metabolism, enzyme changes, fuction of nutrients, compounding rations, feeding standards, feeds, their uses and adaptability in the ration. Lect. 3.

6. Breeding Farm Animals. II; 3 cr. Prerequisites Animal Husbandry 2, 2a; Agronomy 7. Fee $1. Mr. McChord.

Principles and practices of breeding farm animals; study and tabulation of pedigrees. Lect. 2; lab. 1.

7. Beef Cattle and Sheep Production. I; 3 or 4 cr. Prerequisite Animal Husbandry 4. Mr. Arnett.

Feeding, care and management of pure bred and grade beef cattle and sheep. Lect. 3 or Lect. 3; lab 1.

8. Horses, Swine and Dairy Cattle Production. II; 3 or 4 cr. Prerequisite Animal Husbandry 4. Mr. Arnett.

Feeding, care and management of pure bred and grade horses, swine and dairy cattle. Lect. 3 or Lect. 3; lab. 1.

9. Experimental Feeding. II; 2 cr. Prerequisites Animal Husbandry 4, 7. Mr. Arnett, Mr. Joseph.

Methods, principles and results of experimental work in Animal Husbandry. Lect. 1; lab. 1.

10. Thesis. I or II; 2 cr. Mr. Arnett.

Animal husbandry students may elect thesis work during the senior year.

11. Handling and Fitting Live Stock. II; 1 cr. Fee $2. Mr. McChord, Mr. Tretsven.

Fitting and handling live stock for show, sale, breeding and work. Lab. 1.

DAIRY HUSBANDRY.

PROFESSOR G. L. MARTIN.

The course in dairy husbandry embraces both the productive and the manufacturing features of the dairy industry. The first two years are given largely to a study of the general and the agricultural sciences with a view toward preparing the student for their economic application to practical dairy problems.

The productive phase of the work includes the management of the dairy herd, handling of milk on the farm, transportation, distribution, inspection and marketing of milk. The manufacturing phase deals with the more technical work in separation, testing ad preparation of dairy products, factory management, exhibiting, judging and marketing.

This course is designed to fit the student for the rapidly growing demand for men trained in practical, modern dairy science. The positions open are financially attractive, and offer splendid opportunities for rapid advancement, especially as pertains to college experi-

ment station and educational lines. Of no less importance is the commercial side as it pertains to milk production, farm, factory, and corporation management; farm, factory, and municipal inspection; dairy manufacturers and marketing.

For Undergraduates.

1. Farm Dairying. I; 3 cr. Fee $2; Deposit $.50.

Development of the dairy industry, selection of the dairy farm, the cow, the sire, and building up the dairy herd. Secretion, composition, and testing of milk and cream. Care of milk on the farm, operation of hand separators, ripening cream, making butter and marketing dairy products. Lect. 2; lab. 1.

2. Inspection of Milk Products. I; 2 cr. Prerequisites Dairy 1; Chemistry 2. Fee $2; Deposit $.50.

Methods of inspection, scoring stables, dairies, milk depots, factories and markets, composition of milk products in relation to standards of purity. Lect. 1, lab. 1.

3. Creamery Butter Making. II; 4 cr. Prerequisite Dairy 1.

Handling of cream and making butter on a commercial scale. Practice in pasteurizing; making of starters; ripening cream, churning, packing and storage of butter. Lect. 2; lab. 2.

4. Cheese Making. I; 4 cr.

Modern methods of making cheddor cheese as applied to farm and factory practice. Lect. 2; lab. 2.

5. Market Milk. II; 3 cr.

Relation of the milk supply to producer; distributor, and consumer. Grading and pasteurizing, standardizing, certifying, modifying, bottling, and methods of distribution. Lect. 2; lab. 1.

6. Dairy Management. I; 2 cr. Prerequisite Dairy 1.

Organization and management of different systems of dairy farms and factors in the cost of producing milk. Planning and equipping of barns, silos, stalls, milk rooms, and ice houses; organization of herd, improvement associations and advanced registry of dairy cows. Lect. 1; lab. 1.

7. Milk Production. I; 2 cr. Prerequisite Dairy 1.

A study of the milk producing ability of dairy breeds, the factors influencing a persistent milk flow as breeding, feeding and care of the herd. Lect. 1; lab. 1.

8. Factory Management. II; 3 cr. Presequisites Dairy 3, 4.

Organization, location, planning, construction and equipping of factories, handling by-products, preparation of exhibits, scoring, marketing and keeping dairy accounts. Lect. 2, lab. 1.

9. Seminar. Yr.; 2 cr.

Current dairy problems and investigations by experiment stations and comparative studies of practical dairying in other countries.

10. Dairy Technology. II; 3 cr.

Composition, manufacture and utilization of dairy products and by-products as applied in domestic and commercial arts. Lect. 2; lab. 1.

HORTICULTURE.

PROFESSOR, O. B. WHIPPLE. ASSISTANT PROFESSOR, C. C. STARRING.

The four years' course in horticulture, leading to the degree of Bachelor of Science in horticulture, is designed to prepare students as teachers in agricultural colleges, investigators in the agricultural experiment stations, editors of horticultural papers, managers of fruit associations and superintendents of commercial orchards and fruit plantations. The Western United States leads the world in methods of orcharding and disposing of orchard products, and there is a strong and growing demand for persons properly trained to manage the orchard project now operated throughout the fruit regions of the west. Fruit growing, when done in a scientific way, is extremely profitable and presents an inviting field for the trained horticulturist. The college offers good facilities for a thorough training in all branches of horticulture.

For Undergraduates.

1. Principles of Plant Production. II; 3 cr. Prerequisite Botany 1. Fee $1.50; Deposit $1. Mr. Whipple.

Propagation of plants by spores, seeds, cuttings, layers, graftage, Methods of gathering and storing seeds; transplanting. Lect. 2; lab. 1.

4. Systematic Pomology. I; 3 cr. Prerequisites Horticulture 1, Botany 1. Fee $5. Mr. Whipple.

Description and naming of varieties of fruit. Judging of exhibition fruit and discussion of score cards. Evolution of cultivated plants, especially fruits. Lect. 2; lab. 1.

5. Greenhouse Construction and Management. II; 3 cr. Prerequisites Horticulture 1, Agronomy 2, 3. Mr. Whipple.

Construction, heating and maintaining of greenhouses; growing plants in greenhouses and conservatories. Lect. 3.

6. Landscape Gardening. II; 3 cr. Fee $1. Mr. Starring.

Laying out and planting of private and public grounds are discussed. Trees, shrubs, and flowers suited to Montana conditions are studied. Lect. 2; lab. 1.

7. Commercial Fruit Growing. I; 3 cr. Prerequisites Horticulture 1, 4, Agronomy 2, 3. Mr. Whipple.

Planting, cultivating, irrigating and managing commercial orchards. Methods of picking, grading, packing, and marketing fruits. Lect. 2; lab. 1.

8. Thesis. Credits variable. Mr. Whipple.

Horticultural students may elect to prepare during the senior year a thesis, the subject of which must be approved by the head of the department of horticulture.

10. Fruit Growing and Gardening. I; 4 cr. Prerequisite Horticulture 1. Mr. Whipple. Mr. Starring.

Principles of orcharding and gardening, with special reference to their bearing upon home orcharding and home gardening. Lect. 4.

11. Commercial Vegetable Growing. II; 3 cr. Prerequisites Horticulture 1, 10, Agronomy 2. Mr. Starring.

Organization and management of market and truck gardens; special problems connected with growing vegetables on a large scale. Preparation of vegetables for market; methods of marketing, storage of vegetables. Lect. 2; lab. 1.

POULTRY HUSBANDRY.

PROFESSOR, W. F. SCHOPPE.

For Undergraduates.

41. Poultry Management. I; 4 cr.

Types and breeds of poultry, fancy and utility classification of fowls, principles of breeding, housing, feeding, incubation, and brooding, preparation for and marketing of poultry products. Lect. 3; lab. 1.

42. Poultry Breeds. I; 4cr.

Origin and development of the more important breeds of poultry, breeding fancy poultry. Preparation of birds for show. Judging by score card and comparison. Lect. 2; lab. 2.

43. Incubation and Brooding. II; 3 cr.

Operating incubators, testing eggs, keeping records, operating brooders, care and feeding of chicks. Lect. 2; lab. 1.

44. Poultry Houses. II; 4 cr.

Planning, arranging, and designing poultry houses. Lect. 3; lab. 1.

45. Poultry Feeds and Feeding. I; 3 cr.

Feeds suited to poultry, grain mixture, etc., feeding for egg production and fattening stock for market Lect. 2; lab. 1.

46. Marketing Poultry Products. I; 3 cr. Fee $1.

Preparation of poultry and eggs for market, storage preservation, principles of marketing, killing, picking, and packing poultry. Drawing, boning and trussing fowls for special market. Candling, grading, and packing eggs. Lect. 2; lab. 1

47. Advanced Poultry Breeding. II; 3 cr. Prerequisites Agronomy 7, Poultry 42.

Breeding birds for show purposes; judging birds, selection and mating of birds for fancy and utility purposes. Lect. 2; lab. 1.

VETERINARY SCIENCE.

PROFESSOR, H. WELCH.

For Undergraduates.

51. Veterinary Physiology and Anatomy. II; 4 cr. Fee $2.

Physiology of domestic animals, dealing with digestion and assimilation of foods, the circulation and functions of the blood, the nervous system and organs of special sense, and muscles and phenomena of locomotion. Lect. 3; lab. 1.

53. Pathology. II; 3 cr. Prerequisite Veterinary Science 51.

Study of normal and pathological tissues. Gross and microscopical specimens will be used for demonstration. Lect. 1; lab. 2.

54. Obstetrics. II; 2 cr. Prerequisite Veterinary Science 51.

Diseases of domestic animals incident to reproduction. Normal parturition, dystokia, and care of the newborn; illustrated by clinic cases. Lect. 2.

56. Sanitary Science. I; 2cr. Prerequisites Veterinary Science 57, Botany 12.

Care and handling of farm animals affected with contagious and infectious diseases. Methods of diagnosis, treatment, quarantine and general preventitive measures. Lect. 2.

57. Common Diseases of Animals. II; 4 cr. Prerequisites Veterinary Science 51, Bacteriology 12.

Diagnosis and first aid treatment of the more common ailments of live stock. Farm sanitation and general measures for disease prevention. Illustrated by clinic cases. Lect. 4.

College of Engineering

The rapid development of the State of Montana makes the profession of engineering one of great importance. The development of our natural resources will require the services of engineers with specialized training.

As a result of the action of the State Board of Education, made necessary by the passage of the Leighton Bill, all engineering courses supported by the state, except the course in mining engineering at the School of Mines at Butte, have been concentrated in the State College at Bozeman. As a result of this concentration of effort, important additions and improvements have been made, very important additional laboratory space has been provided and extensive and important additions have been made to the equipment largely without cost to the State.

COURSE IN ARCHITECTURAL ENGINEERING.

FRESHMAN YEAR.

First Semester.		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
Algebra (Math. 1)	3	Anal. Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Mechanical Drawing (M. E. 1)	3	Architectural Drawing (Art 3)	2
Shop Work (M. E. 2)	3	Military Science (Mil. Sci. 2)	1
Military Science (Mil. Sci. 1)	1		
	19		19

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2	Theoretical Mechanics (C. E. 5)	4
Calculus (Math. 4)	5	Calculus (Math. 4)	4
Engineering Physics (Phys. 1)	3	Engineering Physics (Phys. 1)	3
Physical Meas. (Phys. 2)	2	Physical Meas. (Phys. 2)	2
Architectural Drawing (Art 3a)	2	Architectural Drawing (Art 3a)	2
Working Drawings (A. E. 1)	3	Elementary Design (A. E. 4)	2
Building Sanitation (A. E. 5)	1	Military Science (Mil. Sci. 4)	1
Military Science (Mil. Sci. 3)	1		
	19		18

JUNIOR YEAR.

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mech. of Materials (C. E. 6)	4	Masonry Construction (A. E. 14)	3
Graphic Statics (C. E. 28)	2	Roofs and Bridges (C. E. 29)	3
Strength of Materials (C. E. 8)	1	Hydraulics (C. E. 43)	1
Steam and Gas (M. E. 7)	2	Specifications and Working Drawings (A. E. 7)	3
History of Architecture (A. E. 2)	3	History of Architecture (A. E. 3)	3
Specifications and Working Drawings (A. E. 6)	3	Estimating (A. E. 8)	2
Elective	2	Elective	2
	19		19

SENIOR YEAR.

Engineering Economics (Econ. 5)	3	Heat and Ventilation (M. E. 24)	2
Bridge Design (C. E. 30)	4	Architectural Engr. (A. E. 16)	3
Foundations and Masonry (C. E. 21)	3	Concrete Construction (C. E. 32)	3
Electrical Power (E. E. 14)	3	Steel Mill Building (A. E. 11)	2
Architectural Decoration (A. E. 10)	2	Contracts and Specifications (C. E. 23)	1
Architectural Engineering (A. E. 15)	2	Illumination (E. E. 19)	2
Elective	2	Cement and Concrete (C. E. 34)	1
		Thesis (A. E. 12)	4 or 5
	19		18 or 19

COURSE IN CHEMICAL ENGINEERING.

FRESHMAN YEAR.

First Semester.		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
Algebra (Math. 1)	3	Anal. Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Mechanical Drawing (M. E. 1)	3	Machine Work (M. E. 9)	2
Shop Work (M. E. 2)	3	Military Science (Mil. Sci. 2)	1
Military Science (Mil. Sci. 1)	1		
	19		19

SOPHOMORE YEAR.

Calculus (Math. 4)	5	Calculus (Math. 4)	4
Engineering Physics (Phys. 1)	3	Engineering Physics (Phys. 1)	3
Physical Measurements (Phys. 2)	2	Physical Measurements (Phys. 2)	2
Quantitative Analysis (Chem. 3)	4	Quantitative Analysis (Chem. 3)	4
Mechanism (M. E. 5)	3	Mechanics (C. E. 5)	4
Military Science (Mil. Sci. 3)	1	Military Science (Mil. Sci. 4)	1
	18		18

JUNIOR YEAR.

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mechanics of Materials (C. E. 6)	4	Sound and Light (Phys. 3 and 4)	4
Organic Chemistry (Chem. 5)	4	Adv. Organic Chemistry Chem. 9)	4
Thermodynamics (M. E. 18)	4	Thermodynamics (M. E. 18)	4
Electricity and Magnetism (Phys. 5)	4	Mechanical Lab. (M. E. 15a)	2
		Fuel Analysis (Chem. 17)	3
	18		19

SENIOR YEAR.

Engineering Economics (Econ. 5)	3	Contracts and Spec. (C. E. 23)	1
Electric Power (E. E. 14)	3	Industrial Chemistry (Chem. 14)	5
Industrial Chemistry (Chem. 14)	5	Seminar (Chem. 20)	1
Physical Chemistry (Chem. 19)	4	Thesis (Chem. 21)	3
Strength of Materials (C. E. 8)	1	Elective	7 or 9
Seminar Chem. 20)	1		
Thesis (Chem. 21)	1		
	18		17 or 19

COURSE IN CIVIL ENGINEERING

FRESHMAN YEAR.

First Semester.		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
Algebra (Math. 1)	3	Analytical Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Mechanical Drawing (M. E. 1)	3	Land Surveying (C. E. 1)	2
Shop Work (M. E. 2)	3	Military Science (Mil. Sci. 2)	1
Military Science (Mil. Sci. 1)	1		
	19		19

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2	Calculus (Math. 4)	4
Calculus (Math. 4)	5	Engr. Physics (Phys. 1)	3
Engineering Physics (Phys. 1)	3	Physical Measurements (Phys. 2)	2
Physical Measurements (Phys. 2)	2	Theoretical Mechanics (C. E. 5)	4
Plane Surveying (C. E. 2)	3	Geology (Geol. 1)	)
Minerology (Geol. 2)	)	or	) 3
or	) 3	Water Analysis (Chem. 18)	)
Engr. Chemistry (Chem. 12)	)	Railroad Engineering (C. E. 4)	2
Military Science (Mil. Sci. 3)	1	Military Science (Mil. Sci.4)	1
	19		19

JUNIOR YEAR.

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mechanics of Materials (C. E. 6)	4	Hydraulics (C. E. 37)	3
Highway Engineering (C. E. 7)	2	Roofs and Bridges (C. E. 29)	3
Irrigation Engineering (C. E. 36)	3	Hydraulic Lab. (C. E. 38)	1
Strength of Materials (C. E. 8)	1	Astronomy (Math. 6)	4
Graphic Statics (C. E. 28)	2	Hydraulic Engineering (C. E. 15)	5
Railroad Economics (C. E. 9)	3	Mechanical Lab. (M. E. 15a)	1
Steam and Gas (M. E. 7)	2		
	19		19

SENIOR YEAR.

Engineering Economics (Econ. 5)	3	Sanitary Engineering (C. E. 14)	3
Bridge Design (C. E. 30)	4	Bridges and Dams (C. E. 31)	2
Municipal Engineering (C. E. 3)	2	Concrete Construction (C. E. 32)	3
Foundations and Masonry (C. E. 21)	3	Cement and Concrete (C. E. 34)	1
Geodesy (C. E. 17)	2	Cont. and Specifications (C. E. 23)	1
Electric Power (E. E. 14)	3	Steel Mill Building (A. E. 11)	)
Elective	2	or	) 2
		Highway Engineering (C. E. 35)	)
		Seminar (C. E. 12)	1
		Thesis (C. E. 27)	3 or 4
		Elective	2
	19		18 or 19

COURSE IN ELECTRICAL ENGINEERING.

FRESHMAN YEAR.

First Semester.		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
Algebra (Math. 1)	3	Analytical Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc Geometry (M. E. 3)	4
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Mechanical Drawing (M. E. 1)	3	Machine Work (M. E. 9)	2
Shop Work (M. E. 2)	3	Military Science (Mil. Sci. 2)	1
Military Science (Mil. Sci. 1)	1		
	19		19

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2	Calculus (Math. 4)	4
Calculus (Math. 4)	5	Engineering Physics (Phys. 1)	3
Engineering Physics (Phys. 1)	3	Physical Measurements (Phys. 2)	2
Physical Measurements (Phys. 2)	2	Theoretical Mechanics (C. E. 5)	4
Electrical Machinery (E. E. 1)	2	Electrical Diagrams (E. E. 7)	2
Electrical Diagrams (E. E. 7)	2	Surveying (C. E. 1)	2
Machine Work (M. E. 34)	2	Military Science (Mil. Sci. 4)	1
Military Science (Mil. Sci. 3)	1		
	19		18

JUNIOR YEAR.

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mechanics of Materials (C. E. 6)	4	Applied Electricity (E. E. 5)	4
Dynamos and Motors (E. E. 3)	3	Heat Power (M. E. 18a)	2
Electricity and Magnetism (Phys. 5)	4	Dynamo Design (E. E. 8)	3
Steam and Gas (M. E. 7)	2	Electrical Lab. (E. E. 6)	2
Strength of Materials (C. E. 8)	1	Mechanical Lab. (M. E. 15a)	2
Electrical Lab. (E. E. 4)	2	Seminar (E. E. 17)	1
Seminer (E. E. 17)	1	Elective	2 or 3
	19		18 or 19

SENIOR YEAR.

Engineering Economics (Econ. 5)	3	Alternating Currents (E. E. 11)	4
Alternating Currents (E. E. 9)	4	Electrical Design (E. E. 16)	3
Electrical Design (E. E. 13)	3	Contracts and Spec. (C. E. 23)	1
Electrical Lab. (E. E. 10)	3	Electrical Lab. (E. E. 12)	2
Seminar (E. E. 17)	1	Seminar (E. E. 17)	1
Thesis (E. E. 20)	2	Thesis (E. E. 20)	3
Elective	2 or 3	Elective	3 or 4
	18 or 19		17 or 18

COURSE IN IRRIGATION ENGINEERING.

The following tabulation is an outline of a course of study for students who desire to specialize in Irrigation Engineering. The work of the freshman and sophomore years is the same as that required of the regular Civil Engineering students.

JUNIOR YEAR.

First Semester		Second Semester	
Organic Chemistry (Chem. 5)	4	Hydraulics (C. E. 37)	3
Mechanics of Materials (C. E. 6)	4	Hydraulic Lab. (C. E. 38)	1
Strength of Materials (C. E. 8)	1	Canal Surveying (C. E. 39)	3
Graphic Statics (C. E. 28)	2	Concrete Construction (C. E. 32)	3
Irrigation Engineering (C. E. 36)	3	Cement and Concrete (C. E. 34)	1
General Botany (Bot. 1)	5	Hydraulic Engineering (C. E. 15)	5
		Roofs and Bridges (C. E. 29)	3
	19		19

SENIOR YEAR.

Steam and Gas (M. E. 7)	2	Mechanical Lab. (M. E. 15a)	2
Field Crops (Agron. 1)	4	Irrigation Engineering (C. E. 40)	3
Soil Physics (Agron. 2)	5	Canal Management (C. E. 41)	3
Farm Management (Aron. 6)	4	Pumping for Irrigation (C. E. 42)	3
Electric Power (E. E. 14)	3	Forage Crops (Agron. 11)	4
		Contracts and Spec (C. E. 23)	1
		Thesis (C. E. 27)	3
	18		19

COURSE IN MECHANICAL ENGINEERING.

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
Algebra (Math. 1)	3	Analytical Geometry (Math. 3)	5
Trigonometry (Math. 2)	2	Desc. Geometry (M. E. 3)	4
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Mechanical Drawing (M. E. 1)	3	Machine Work (M. E. 9)	2
Shop Work (M. E. 2)	3	Military Science (Mil. Sci. 2)	1
Military Science (Mil. Sci. 1)	1		
	19		19

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2	Calculus (Math. 4)	4
Calculus (Math. 4)	5	Engineering Physics (Phys. 1)	3
Engineering Physics (Phys. 1)	3	Physical Measurements (Phys. 2)	2
Physical Measurements Phys. 2)	2	Theoretical Mechanics (C. E. 5)	4
Mechanism (M. E. 5)	3	Mechanism (M. E. 8)	3
Foundry (M. E. 4) and Machine Tool Work (M. E. 27)	3	Pattern Work (M. E. 2a) and Machine Work (M. E. 21)	2
Military Science (Mil. Sci. 3)	1	Military Science (Mil. Sci. 4)	1
	19		19

JUNIOR YEAR.

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Mechanics of Materials (C. E. 6)	4	Machine Design (M. E. 13)	5
Thermodynamics (M. E. 18)	4	Thermodynamics (M. E. 18)	4
Electric Power (E. E. 14)	3	Mechanical Lab. (M. E. 20)	2
Mechanical Lab. (M. E. 15)	3	Electric Power (E. E. 14a)	4
Strength of Materials (C. E. 8)	1	Heat and Ventilation (M. E. 24)	2
Machine Work (M. E. 21)	2		
	19		19

SENIOR YEAR.

Engineering Economics (Econ. 5)	3	Steam Engineering (M. E. 26)	3
Gas Power (M. E. 22)	3	Plant Design (M. E. 29)	2
Machine Design (M. E. 23)	5	Hydraulics (C. E. 37)	3
Mechanical Lab. (M. E. 28)	2	Hydraulic Lab. (C. E. 38)	1
Commercial Engr. (M. E. 25)	3	Contracts (C. E. 23)	1
Elective	3	Seminar (M. E. 11)	1
		Thesis (M. E. 30)	4
		Elective	4
	19		19

College of Engineering

COURSES OF INSTRUCTION.

The Roman numeral I and II designate the semester in which the course is given. When the course is continuous through the year, the abbreviation, "Yr." is used.

ARCHITECTURAL ENGINEERING.

PROFESSOR, W. R. PLEW.

The rapid increase of population in the State of Montana will result in a healthy growth of our cities and towns. Homes, factories, office buildings and public buildings will be erected.

In addition to the sciences which are common to all engineering courses, this course includes a thorough study of freehand drawing and the drawing of architectural designs. Ancient and modern architecture is studied in all its phases in order that the student may become acquainted with proper architectural forms. The construction of steel and concrete buildings, the sanitation of buildings, interior and exterior decoration, and illumination, form an important part of the instruction given.

The course is intended to provide the training which the student will need to prepare himself for professional work as architectural engineer, building superintendent or builder.

For Undergraduates.

1. Working Drawings. I. 3 cr. Fee $1.

Detailing on a large scale, floors, windows, stairs, cornice, cabinet making and conventional methods in architectural drawing. Lab. 3.

2. History of Architecture. I; 3 cr.

History of architectural design from early Egyptian to Renaissance, illustrated by lantern slides. Lect. 3.

3. History of Architecture. II; 3 cr.

A continuation of the above, with special reference to modern times. Lect. 3.

4. Elementary Design. II; 2 cr. Fee $1.

Rendering of the orders and sketch problems involving simple composition. Lab. 2.

5. Building Sanitation. I; 1 cr.

Design and installation of plumbing; removal of waste, sewage disposal, water supply and fixtures in dwellings and public buildings. Lect. 1.

6. Specifications and Working Drawings. I; 3 cr.

Plan and framing problems; ballon framing, detailing of walls, etc. Lab. 3.

7. Specifications and Working Drawings. II; 3 cr.

Masonry details, stereotomy, and buiding specifications. Lect. 3.

8. Estimating. II; 2 cr.

Estimating building costs. Lect. 2.

10. Architectural Decoration. I; 2 cr. Fee $1.

Interior and exterior ornamental design and finish of buildings. Lab. 2.

11. Steel Mill Building. II; 2 cr. Prerequisites Civil Engineering, 28, 29. Fee $1.

Design of trusses in framed bents; arches; mill building construction, slow burning and fire proof construction, specifications. Lab. 2.

12. Thesis. II; 4 or 5 cr.

13. Household Architecture. II; 2 cr.

Elective for students in home economics. Lect. 2.

14. Masonry Construction. II; 3 cr. Fee $1.

The study of building stones and their preparation for use in the wall. Design of masonry construction with special reference to its use in building construction. Stereotomy. Lect. 2; lab. 1.

15. Architectural Engineering. I; 2 cr. Prerequisites Civil Engineering 6, 29; concurrently with Civil Engineering 30. Fee $1.

Design of steel frame work in modern building construction. Lab. 2.

16. Architectural Engineering. II; 3 cr. Prerequisite Architectural Engineering 15. Fee $1.

Design of larger buildings; methods of construction; fireproofing. Lab. 3.

CHEMICAL ENGINEERING.

Professor, W. M. Cobleigh. Assistant Professor, R H Bogue. Instructor, E. C. Hytree.

The chemical engineering course provides for a thorough training in this particular field of work, and deals with the application of chemistry and electro-chemistry to manufacture.

In the first two years the student is taught mathematics, English, drawing, general chemistry, physics, etc. These are followed in the junior and senior years by a thorough course in industrial processes, given by lectures, supplemented by laboratory instruction.

The work includes a thorough study of the manufacture of such materials as cements, glass, fertilizers, explosives, alkalies, acids, paints, sugar, paper, etc.

Special attention is given to heat and its application to industrial processes; to the manufacture of gases and the by-products of gas works.

The above work is supplemented by courses in electrical engineering, steam engineering, etc.

Inspection trips are taken to some of the larger industrial plants of Montana in order that the student may examine the work as actually done in manufacturing plants.

For Undergraduates.

14. Industrial Chemistry. Yr.; 10 cr. Prerequisites Chemistry 3, 4, 5. Fee $4; Deposit $4. Mr. Cobleigh.

General operations common to many chemical industries such as crushing, grinding, calcination, fusion, distillation, filtration, crystalization, etc., and the types of machinery used in these operations. Inspections and reports on various industrial plants in the state. Lect. 3; lab. 2.

17. Fuel Analysis. II; 3 cr. Prerequisite Chemistry. 14. Fee $4; Deposit $4. Mr. Cobleigh.

Production and analysis of solid, liquid, and gaseous fuels, illuminating gas, and lubricating oils. Lect. 1; lab. 2.

18. Water Analysis. I or II; 2 or 4 cr. Prerequisites Chemistry 1, and first semester of Chemistry 3. Fee $4; Deposit $4. Mr. Cobleigh.

Chemical examination of potable waters, of water for industrial purposes and steam raising, of sewages, and of air. Water purification and softening, and sewage treatment. Lect. 1; lab. 1, or Lect. 2; lab. 2.

19. Physical Chemistry. I; 4 cr. Prerequisite Chemistry 3. Fee $1.50; Deposit $1.50. Mr. Hytree.

Theoretical chemistry including the following topics: Sticheometry; gas laws; kinetic theory of gases, radioactivity; electron theory, colloids, osmotic pressure, theory of solution, phase rule, equilibrium in electrotypes, and electro chemistry. Lect. 3; lab. 1.

20. Seminar. Yr. 2 cr. Mr. Cobleigh, Mr. Bogue.

Each student will be required to make abstracts of articles on assigned subjects from the leading journals, and present them at weekly meetings of the students and department instructors where the topics are freely discussed. Students are thus kept in touch with the progress of the science. Lect. 1.

21. Thesis. Yr.; 4 cr. Mr. Cobleigh, Mr. Bogue, Mr. Hytree.

Students in the chemistry course may in the senior year prepare a graduate thesis on some subject which will involve considerable work and originality. Lab. 2.

CIVIL ENGINEERING.

PROFESSORS, L. D. CONKLING, W. R. PLEW. ASSISTANT PROFESSOR, F. C. SNOW.

The civil engineering course is designed to give a broad education in the general and scientific subjects which are the foundation of all branches of technology, and special training in those subjects comprised under the term "Civil Engineering." The young men are taught how to think, and how to attack new problems; they are taught the underlying principles of engineering and inspired with a desire to do their best work. The graduate is prepared to enter upon the location and construction of railroads, public highways, bridges, water works, water power development, irrigation, sewerage systems, and sewage disposal, city and municipal engineering. He can with advantage take up allied work in mining, mechanical, electrical, or architectural engineering.

The freshman year is devoted to fundamental studies which give both general culture and preparation for the technical work of the following years.

In the sophomore year the fundamental subjects of mathematics, English, physics, and chemistry are completed, and the technical subjects of civil engineering are begun. The theory of land surveying is taught by lectures, field work, and drawing room exercises. The study of the theory and principles of highway and railroad engineering is begun.

The junior year completes the work in theoretical and applied mechanics and railroad engineering. The technical subjects of hydraulic engineering, structures and bridges, theory and design, are begun. The course in economics begun in the first term of the junior year is continued for three semesters, and consists of the study of such subjects as land, capital, labor, coinage, banking, interest, wages, taxation, etc. The important economic questions of the present time are considered and discussed.

The senior year is devoted to municipal and sanitary engineering, plain and reinforced concrete construction, the design of typical bridges and buildings, with complete working drawings, bill of materials and estimate of cost.

Special work in irrigation engineering is offered as shown by the tabulation of courses in the department of civil engineering.

The course of study is the same as the regular civil engineering course for the freshman and sophomore years. In the junior and senior years the student in irrigation engineering is required to take courses in organic chemistry, general botany and agronomy, that he may become familiar with the different kinds of soils and the method of handling each; the different kinds of cereals and forage crops, and the methods of selection, planting and irrigation.

Special attention is also given to hydraulic engineering, as it is

important that a student in irrigation engineering should be thoroughly familiar with rainfall, drainage area, storage of water and water power development.

For Undergraduates.

1. Land Surveying. II; 2 cr. Prerequisite Mathematics 2. Fee $1. Mr. Snow.

Theory, adjustment and use of instruments in land surveying, hydrography, water measurement, irrigation and draining, plotting and mapping. Lab. 2.

1a. Surveying. I; 3 cr. Prerequisite Mathematics 2. Fee $1. Mr. Snow.

Theory, adjustment, and use of instruments in land surveying, hydrography, water measurement, irrigation and draining, plotting and mapping, draughting and office work. Lect. 1; lab. 2.

2. Plane Surveying. I; 3 cr. Prerequisites Mathematics 2, Civil Engineering 1. Fee $1. Mr. Snow.

Computation of areas, dividing of land, the methods of field, hydrographic, mine, and city surveying, barometric and spirit leveling, computation of earth work; map drawing and topographic signs; field work with transit level, and plane table; map drawing from students' field notes. Lab. 3.

3. Municipal Engineering. I; 2 cr. Prerequisite Civil Engineerig 2. Mr. Conkling.

City planning, allotting and platting additions; construction of streets, sidewalks, curbs, gutters, and parkings; disposal of refuse; city parks and their paths, walks, and roadways; law affecting the work of the city engineer. Lect. 2.

4. Railroad Engineering. II; 2 cr. Prerequisite Civil Engineering 2. Fee $1. Mr. Snow.

Railroad reconnoisance, preliminary and location surveys. Railroad structures, simple and compound curves, easement curves and transition spirals, simple and compensated grades, switches, turnouts and crossings. Lab. 2.

4a. Summer School in Railroad Engineering. 2 cr. Mr. Snow.

Required of all freshmen civil engineering students at the end of the second semester. Freshmen act as rodmen, chainmen, axemen, etc.

4b. Summer School in Railroad Surveying. 2 cr. Mr. Snow.

Required of all sophomore civil engineering students at the end of the second semester. A camp is established and regular field work is carried on for two weeks.

5. Theoretical Mechanics. II; 4 cr. Prerequisite Mathematics 4. Mr. Snow.

Forces and force systems, center of gravity and centroids, stress, principles of equilibrium, rectilinear and curvilinear motion, work and energy, impulse, momentum and vectors. Lect. 4.

6. Mechanic of Materials. I; 4 cr. Prerequisites Mathematics 4, Civil Engineering 5. Mr. Conkling.

Elasticity and strength of timber, brick, stone and metals. Theory of beams, columns and shafts. Lect. 4.

7. Highway Engineering. I; 2 cr. Mr. Conkling.

Preliminary investigations; surveying, mapping and design; grading, drainage, and foundations; natural and hard surfaced roads; pavements, etc. Lect. 2.

8. Strength of Materials. I; 1 cr. Prerequisite Civil Engineering 6. Fee $2; Deposit $2. Mr. Conkling.

Experimental determinations of the strength and the several moduli of the more important of the materials of engineering. Lab. 1.

9. Railroad Economics. I; 3 cr. Prerequisite Civil Engineering 4. Fee $1. Mr. Snow.

Making of profiles, field maps, cross-sections, etc., from students' notes of field work. Economics of railroad location; arrangement of yards, terminals and stations. Making location map. Construction of the roadbed. Maintenance of way and the elements of railroad operation. Lect. 1; Lab. 2.

12. Seminar. II; 1 cr. Mr. Conkling, Mr. Snow.

Members of the senior class meet to discuss the articles that appear in certain assigned engineering periodicals. Lect. 1.

14. Sanitary Engineering. II; 3 cr. Prerequisites Civil Engineering 1, 3, 15. Mr. Snow.

Methods of sewage treatment and disposal. The design of a sewage system and a disposal plant; house drainage; specifications and estimate of cost. Lect. 2; lab. 1.

15. Hydraulic Engineering. II; 5 cr. Prerequisites, Civil Engineering 39, 40. Mr. Conkling.

Precipitation, drainage area, runoff, storage, public water supplies, reservoirs, pipe lines, pumping plants, purification plants, power development, etc. Lect. 4; lab. 1.

17. Geodesy. I; 2 cr. Prerequisites Mathematics 6, Civil Engineering 1, 2, 4. Mr. Snow.

Base line measurements, triangulation balancing surveys and distributing errors, application of the method of least squares, principles of map projection. Determination of azimuth, latitude and longitude, the true north by sun and star observations. Lab. 2.

21. Foundations and Masonry. I; 3 cr. Prerequisites Civil Engineering 6, 28. Mr. Conkling.

Materials and methods employed in the construction of piers, abutments, masonry dams, retaining walls and foundations; economy of construction; strength of joined materials, specifications and costs. Lect. 2; lab. 1.

23. Contracts and Specifications. II; 1 cr. Mr. Conkling.

Correct form of specifications and judicial interpretation placed on technical terms commonly used in engineering specifications. Elective to all engineering students after the sophomore year. Lect. 1.

27. Thesis. II; 3 or 4 cr. Mr. Conkling.

The student will be required, before graduation, to present a suitable thesis upon some engineering subject in the line of his course. Subject must be chosen at the beginning of the senior year.

28. Graphic Statics. I; 2 cr. Prerequisites Physics 1, 2, Civil Engineering 5. Fee $1. Mr. Plew.

Stresses in roof trusses by the force polygon. Application of equilibrium polygon to beams and girders. Stresses in bridge trusses, retaining walls and masonry arches. Lab. 2.

29. Roofs and Bridges. II; 3 cr. Prerequisites Civil Engineering 6, 28. Fee $1. Mr. Plew.

Theory and computation of stress in roof and bridge trusses under dead, live, and wind loads. Locomotive wheel loads on plate girders and bridge trusses. Lect. 2; lab. 1.

30. Bridge Design. I; 4 cr. Prerequisites Civil Engineering 6, 29. Fee $1. Mr. Plew.

Designing of girders and trusses; computations and complete drawings for a through plate girder railroad bridge, and for a highway truss bridge. Specifications, bill of materials and estimate of cost. Lect. 1, drawing 3.

31. Bridges and Dams. II; 2 cr. Prerequisite Civil Engineering 30. Mr. Plew.

Higher structures, including continuous draw, cantilever, and suspension bridges; theory and design of masonry walls, and dams other than the gravity section. Lect. 2.

32. Concrete Construction. II; 3 cr. Prerequisite Civil Engineering 6. Mr. Plew.

Design of reinforced concrete beams and slabs, reinforced concrete buildings and other structures. A complete design of a reinforced concrete arch by the Elastic Theory. Specifications and costs. Lect. 2; lab. 1.

34. Cement and Concrete. II; 1 cr. Prerequisite Civil Engineering 6. Fee $2. Deposit $2. Mr. Conkling.

Manufacture and properties of hydraulic cement, proportioning and mixing concrete. Standard tests of sand and cement. Test of concrete beams, etc. Lab. 1.

35. Highway Engineering. II; 2 cr. Prerequisite Civil Engineering 7. Mr. Conkling.

Roads and pavements, contracts and specifications; methods of financing; organization and administration; legislation and state laws. Lect. 2.

36. Irrigation Engineering. I; 3 cr. Mr. Snow.

History of irrigation; the principles of irrigation and location of irrigation system. Lect. 3.

37. Hydraulics. II; 3 cr. Prerequisites, Mathematics 1, 2, 4; Physics 1, 2. Mr. Conkling.

Theoretical hydraulics, hydraulic measurements; flow of water through orifices, over weirs, through pipes, conduits and canals. Lect. 3.

38. Hydraulic Laboratory. II; 1 cr. Prerequisite Civil Engineering 37. Fee $2; Deposit $2. Mr. Conkling.

Flow of water over weirs, through nozzles and pipes, open channels and conduits, etc. Lab. 1.

39. Canal Surveying. II; 3 cr. Prerequisite Civil Engineering 1. Fee $1. Mr. Snow.

Theory and practice of canal surveying, computation of earth work, field location of canals and ditches for irrigation. Lect. 1, field work 2.

40. Irrigation Engineering. II; 3 cr. Prerequisites Civil Engineering 36, 37, 38. Mr. Conkling.

Manner of supplying, storing, conveying and distributing irrigation water; management of irrigation systems; irrigation laws. Lect. 3.

41. Canal Management. II; 3 cr. Prerequisite Civil Engineering 40. Mr. Snow.

Canal management, seepage and drainage. Lect. 3.

42. Pumping for Irrigation. II; 3 cr. Mr. Conkling.

Small rotary and reciprocating pumps. Steam, gas and oil engines used for pumping. Electric motor driven pumps. Lect. 3.

43. Elementary Hydraulics. II; 1 cr. Prerequisites Mathematics 1, 2, 4; Physics 1, 2. Mr. Conkling.

Elementary course in theoretical hydraulics for students in Architectural Engineering. Course given each alternate year beginning February 1918.

ELECTRICAL ENGINEERING.

Professor, J. A. Thaler. Instructor, R. D. Sloan.

The course in electrical engineering is designed to give a thorough technical training in which theoretical subjects and the application of theory to the solution of practical problems are emphasized.

The general training consists of courses in English, mathematics, physics, chemistry, drawing and shop work. The technical work covers the theory and application of electrical phenomena, and the designing and testing of electrical machines and apparatus.

The equipment of the electrical laboratory is very complete, with apparatus of modern type, as well as machines of historical value.

The laboratories contain various types of direct and alternating current dynamos ad motors, storage batteries, an oscillograph, a 150,000 volt transformer, a wireless station, and other equipment.

For Undergraduates.

1. Electrical Machinery. I; 2 cr. Mr. Thaler.

Construction, care and operation of commercial electrical machines and apparatus, including batteries, electric lights, dynamos, motors, alternators, transformers, and electrical measuring instruments. Lect. 2.

3. Dynamos and Motors. I; 3 cr. Prerequisites Physics 1, Mathematics 4. Mr. Sloan.

Principles of electro-magnetism, theory of dynamo electric machines, design, construction and regulation of direct current dynamos and motors. Lect. 3.

4. Electrical Laboratory. I; 2 cr. Prerequisites Physics 2, 5. Fee $1; Deposit $5. Mr. Sloan.

Determination of armature and field resistance, magnetic leakage coefficients, characteristic curves and the efficiency and regulation of various types of direct current machines. Lab. 2.

5. Applied Electricty. II;4 cr. Mr. Sloan.

Storage batteries, electric lighting and lighting systems. Direct current distribution systems. Lect.4.

6. Electrical Laboratory. II; 2 cr. Prerequisite Physics 2. Fee $1; Deposit $5. Mr. Sloan.

Tracing circuits and wiring, calibrating instruments, efficiency tests of storage batteries, and the candle power of incandescent lamps. Lab. 2.

7. Electrical Diagrams. Yr. 4 cr. Mr. Sloan.

Conventional methods of representing electrical wiring and appliances. National Electrical Code. Diagrams of D. C. switchboards and electric light wiring. General and detail drawing of dynamos. Lab. 4.

8. Dynamo Design. II; 3 cr. Prerequisite Electrical Engineering 7. Mr. Sloan.

Designing electro-magnets, dynamos and motors. Complete working drawings and specifications to accompany each design. Lab 3.

9. Alternating Currents. I; 4 cr. Prerequisite Physics 5. Mr Thaler.

Theory of alternating currents, properties of alternating current circuits, principles of alternators, transformers, rotary converters and induction motors. Lect. 4.

10. Electrical Laboratory. I; 3 cr. Prerequisite Physics 5. Fee $1; Deposit $5. Mr. Thaler.

Tests of single phase alternating current generators, motors and transformers, calibration of alternating current measuring instruments and meters. Lab. 3.

11. Alternating Currents. II; 4 cr. Prerequisite Electrical Engineering 9. Mr. Thaler.

Development of the symbolic method of Steinmetz, the solution of problems in transformer design and calculation of transmission line by the use of the algebra complex number and by vector diagrams. Lect. 4.

12. Electrical Laboratory. II; 2 cr. Prerequisite Electrical Engineering 10. Fee $1; Deposit $5. Mr. Thaler.

Tests of polyphase alternating current apparatus, including generators, motors, transformers and converters. Efficiency and regulation tests of a mercury arc rectifier, connecting transformers for transforming from three phase to two phase. Lab. 2.

13. Electrical Design. I; 3 cr. Mr. Sloan.

Drawing and design of alternating current apparatus, circuits, and power plants. Open to students taking Electrical Engineering. 9. Lab. 3.

14. Electric Power. I; 3 cr. Mr. Sloan.

Theory and construction of direct and alternating current generators, motors, transformers, and storage batteries; principles of power transmission and distribution. Lect. 3.

14a. Electric Power. II; 4cr. Prerequisite Electrical Engineering 14. Fee $1; Deposit $5. Mr. Sloan.

Industrial applications of electricity. Electrical equipment of power stations and substations. Efficiency and regulation tests of batteries, transformers, direct and alternating current generators and motors. Lect. 2; lab. 2.

15. Wireless Telegraphy. Yr.; cr. variable. Prerequisite Physics 5. Mr. Thaler.

Theory and development of wireless telegraphy; commercial apparatus and instruments for sending and receiving station. Lect. 2; lab. 1.

16. Electrical Design. II; 3 cr. Prerequisite Electrical Engineering 9. Mr. Thaler.

Design and drawing of a transformer or induction motor to conform with certain specifications for efficiency, including the calculations of the weight and cost of material. Lab. 3.

17. Seminar. Yr.; 2 cr. Mr. Thaler.

Weekly meeting for the purpose of discussing current electrical engineering literature. Lect. 1.

18. Special Design. Credits variable. Mr. Thaler.

Design and construction of some special electrical apparatus or machine. Elective for seniors. Lab. 3.

19. Illumination. II; 2 cr. Mr. Thaler.

Sources of light, laws of photometry and measurement of light, calculation of illumination, electric light wiring, underwriters' rules and symbols of the National Contractors' Association. Lect. 2.

20. Thesis. Yr. 5 cr. Mr. Thaler.

Before graduating each student must present a suitable thesis upon some engineering subject in line with his course. The subject for the thesis must be chosen at the beginning of the senior year.

MECHANICAL ENGINEERING.

Professor, A. W. Richter (Dean). Assistant Professors, W. J. Wohlenberg, R. T. Challender. Instructors, F. C. Miller, F. C. Homann, F. Kately.

The course in mechanical engineering furnishes fundamental training in the science, the art and the business of engineering; the design, operation, superintendence and management of power plants, heating plants, refrigerating plants, lighting plants, pumping plants, and the mechanical equipment of mines and railroads; and for the design, manufacture, installation, testing and operation of shop and laboratory machinery. steam and gas engines and auxiliary equipment.

The course comprises four years' instruction and training by text book, lecture, laboratory and shop practice, based on mathematics, physics, chemistry, mechanics, machine design, structural design and thermodynamics. It is designed to give the student a thorough knowledge of the basic principles of his profession and such technical skill as the application of theoretical principles in every day practice in shop and laboratory will insure. The work of each department, class room, laboratory, shop and designing room is made to supplement the work of each of the others, so that the graduate beginning his profession has a valuable fund of practical and scientific knowledge.

For Undergraduates.

1. Mechanical Drawing. I; 3 cr. Mr. Miller.

Use of drawing instruments and plain lettering; problems in geometric construction to teach accuracy in the use of instruments; orthographic projections, dimensions, arrangement, titles; tracing and blue-printing. Lab. 3.

1a. Mechanical Drawing. Yr. 4 cr. Mr. Miller.

Use of drawing instruments. Plain lettering; problems in geometric construction, tracing and blue-printing. Lab. 2.

2. Shop Work. I; 3 cr. Fee $5. Mr. Challender, Mr. Homann. Mr. Kately.

Use and care of carpenters' tools. Wood work. Elementary pattern work. Iron forging, upsetting and welding. Lab. 3.

2a. Pattern Work. II; 1 cr. Prerequisite Mechanical Engineering 2 Fee $1. Mr Challender.

Construction of wood patterns for use in the foundry. Advanced pattern work. Lab. 1.

2b. Wood Work. I; 2 cr. Fee $3. Mr. Challender.

Use and care of carpenters' tools and practice in working to dimensions from blue-prints, building construction, roof framing and mill work. Lab. 2.

3. Descriptive Geometry. II; 4 cr. Mr. Miller.

Projection of lines, plane surfaces and solids; intersections, tangents to curves and surfaces; problems in warped surfaces, practical applications. Perspective. Lect. 1; lab. 3.

4. Foundry. I; 1 cr. Fee $1.50. Mr. Kately.

Floor and bench molding, core making, pouring castings of iron, brass and other alloys. Lab. 1.

5. Mechanism. I; 3 cr. Prerequisite Mechanical Engineering 1. Mr. Challender.

Relative motions of machine parts, including rolling cylinders and cones, lobed wheels, belts, levers, cams, linkwork, parallel and car steering mechanisms. Lect. 2; lab. 1.

7. Steam and Gas. I; 2 cr. Prerequisites Chemistry 1; Physics 1, 2. Mr. Richter.

Steam boilers, their classification and construction, combustion and furnace efficiency, the principles underlying the economical transfer of heat from the furnace to the water. Steam and gas engines, scale corrosion and feed water treatment. Lect. 2.

8. Mechanism. II; 3 cr. Prerequisites Mechanical Engineering 1, 5. Mr. Challender.

Gearing, cycloidal and involute systems, spur, bevel, helical and worm gears. Change gears, gearing in train, epicyclic trains with special application to automatic feeds and differential transmission. Valve gears. Plain and riding cut-off. Corliss and poppet valves. Lect. 1; lab. 2.

9. Machine Work. II; 2 cr. Fee $2. Mr. Homann.

Bench work in iron, chipping and filing. Lathe work in metals. Boring, planing and milling of metals. Lab. 2.

11. Seminar. II; 1 cr. Mr. Richter.

Weekly meetings for the presentation and discussion of papers upon assigned topics pertaining to mechanical engineering. Lect. 1.

13. Machine Design. II; 5 cr. Prerequisite Mechanical Engineering 8. Mr. Wohlenberg.

Elementary theory of machine design supplemented by applications in the drafting room. Straining actions in stressed machine members and frames, materials used and forms for strength, fastenings, friction. Journals and design elements of mechanical transmitters of power. Lect. 3; lab. 2.

15. Mechanical Laboratory. I; 3 cr. Prerequisite Physics 1. Mr. Wohlenberg.

Calibration of instruments, calorimetry, indicator practice, steam, fuel and lubricating oils. Determination of power input, output and mechanical efficiency. Lect. 1; lab. 2.

15a. Mechanical Laboratory. II; 1 or 2 cr. Prerequisite Mechanical Engineering 7. Fee $1.50. Mr. Wohlenberg.

Short Course. Indicator practice; efficiency tests of boilers, pumps and electric power units.

18. Thermodynamics. Yr; 8 cr. Prerequisites Mathematics 4; Chemistry 1; Physics 1, 2. Mr. Richter.

Gases, saturated and superheated vapors and mixtures, cycle processes, flow of fluids through nozzles, and throttling processes. Heat engines and boilers. Lect. 4.

18a. Heat Power. II; 2 cr. Prerequisite Mechanical Engineering 7. Mr. Richter.

Prime movers for central stations. Lect. .2

20. Mechanical Laboratory. II; 2 cr. Prerequisites Mechanical Engineering 15, 18. Fee $2. Mr. Wohlenberg.

Exercises in valve setting. Fuel consumption tests of gasoline and oil engines. Tests of injectors, pumps and engines, etc. Lab. 2

21. Machine Work. II; 1 cr; I; 2 cr. Prerequisite Mechanical Engineering 2. Fee $3. Mr. Homann.

General shop work, building complete machines. Lab. 3.

22. Gas Power. I; 3 cr. Mr. Wohlenberg.

Performance and design of gas motors, gas producers and other gas machinery and air machinery. Gas mixtures and their behavior within the engine cylinder. Method of governing. Types of engines. Lect. 3.

23. Machine Design. I; 5 cr. Prerequisites Mechanical Engineering 13, 18. Mr. Wohlenberg.

Principally a study of the machine design problems involved in the design of prime movers. Energy cycle of reciprocating parts, crank shaft design. Fly wheels, stresses and strains in rotating discs and drums. Forms for strength. Governor energy cycle, governor design to accomplish given speed regulations for parallel and other operation of prime movers. Lect. 3; lab. 2.

24. Heating and Ventilation. II; 2 cr. Prerequisite Mechanical Engineering 7. Mr. Wohlenberg.

Heating buildings by the various systems; ventilation with calculations for specific installations, specifications and estimate of costs. Lect. 1; lab. 1.

25. Commercial Engineering. I; 3 cr. Mr. Wohlenberg.

General principles underlying the organization, management and operation of industrial establishments. Valuation of the physical properties of a plant. The public utility commission and public service corporations. The United States patent office. Inventions and their protection. Application for patents. Lect. 3.

26. Steam Engineering. II; 3 cr. Prerequisite Mechanical Engineering 18. Mr. Wohlenberg.

Performance and design of steam motors and refrigerating machines. Lect. 2; lab. 1.

27. Machine Tool Work. I; 2 cr. Fee $3. Mr. Homann.

Work on lathe, milling machine and grinder; manufacture of reamers, drills, taps, mills and dies. Lab. 2.

28. Mechanical Laboratory., I; 2 cr. Prerequisite Mechanical Engineering 15. Fee $3. Mr. Wohlenberg.

Efficiency tests of heating, ventilating, compressed air, refrigerating and power plant equipment, steam and gas power plants and machinery. Lab. 2.

29. Plant Design. II; 2 cr. Prerequisites Mechanical Engineering 15, 18. Mr. Wohlenberg.

Design of a plant for a specific purpose,—i.e., heating, lighting, refrigerating, compressed air or shop plant, etc. Lab. 2.

30. Thesis. II; 4 cr.

Before graduating the student is required to present an accepted thesis involving an investigation of some problem related to mechanical engineering. Work will be done under the supervision of the head of the department, but the student will devise his own methods.

32. Automobile Practice. I or II; 2 cr. Fee $2. Mr. Homann.

Engines, carburetors, ignition and lighting systems, oiling and tires. Numer in class will be limited. Lab. 2.

33. Tractor Power. II; 2 cr. Mr. Homann.

Steam, gasoline and oil tractors. Lab. 2.

34. Machine Work. I; 2 cr. Fee $3. Mr. Homann.

General machine work, continuation of course Mechanical Engineering 9. For electrical engineers. Lab. 2.

College of Applied Science

The departments comprised in the College of Applied Science have a two-fold duty to perform.

(1) They give instruction and training in the fundamental sciences as applied in agriculture, engineering and home economics. A large and important part of the student's work in these major divisions, of the institution is given in the science departments.

(2) They also offer several courses of instruction in which the main object is to prepare specialists in the various branches of the basic sciences. These courses also give an excellent general training and may be taken by those students of agriculture, engineering and home economics, who desire to give more attention to the fundamental and less to the more specialized branches of agriculture, engineering and home economics.

The courses of instruction in the College of Applied Science, each leading to the degree of Bachelor of Science, are as follows: 1, Botany and Bacteriology; 2. Chemistry; 3. Entomology and Zoology; 4. Industrial Chemistry.

Recognizing that beginning students will be benefited by an opportunity to spend at least one year in the institution before committing themselves to a line of study to be followed, the work in the freshman year has been made the same in courses 1, 2, and 3, while in course 4 the freshman year is like that of the engineering course. During his first year the student takes up a considerable variety of studies and often learns what line of work he is best adapted for. At the opening of the sophomore year he can change courses within the same group without loss of time. Again, the freshman year in the agricultural courses, listed elsewhere in the catalogue, is so much like the freshman year in the first three courses that usually a change in either direction can be made without inconvenience. In the same way changes can be made between the industrial chemistry course and those in engineering.

COURSE IN BOTANY AND BACTERIOLOGY.

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
General Botany (Bot. 1)	5	Agricultural Physics (Phys. 1a)	5
Trigonometry (Math. 2a) or	3	Elective	4 to 6
Ele. Analysis (Math. 7)		Military Science (Mil. Sci. 2) or	1
Elective	2 or 3	Physical Education (Phys. Ed. 1)	
Military Science (Mil. Sci. 1) or	1		
Physical Education (Phys. Ed. 1)			
	18 or 19		17 to 19

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2	Expository Composition (Eng. 2)	2
Organic Chemistry (Chem. 5)	4	Agricultural Chemistry (Chem. 7)	5
Invertebrate Zoology (Zool. 1)	4	Economic Entomology (Ento. 4)	4
*Field Crops (Agron. 1)	4	Geology (Geol. 1)	3
*Fruit Grow. and Garden. (Hort. 10)	4	Systematic Botany (Bot. 2)	4
Military Science (Mil. Sci. 3 or	1	Military Science (Mil. Sci. 4) or	1
Physical Education (Phys. Ed. 2)		Physical Education (Phys. Ed. 2)	
	19		19

JUNIOR YEAR.

Advanced Composition (Eng. 3) or	2	Advanced Composition (Eng. 3) or	2
English Literature (Eng. 10)		English Literature (Eng. 10)	
General Bateriology (Bact. 12)	5	Sanitary Bacteriology (Bact. 13)	2
Quantitative Analysis (Chem. 3)	4	Plant Physiology (Bot. 3)	4
Meteorology (Phys. 10)	3	Plant Pathology (Bot. 4)	4
Elective	2 to 5	Organic Evolution (Zool. 9)	3
		Elective	2 to 4
	16 to 19		17 to 19

SENIOR YEAR.

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Psychology (Ed. 1a)	3	Sociology (Soc. 4)	3
Thesis (Bot. 11)	5	Advanced Econ. Ento. (Ento. 6) or Human Physiology and Anatomy (Zool. 3)	4 or 5
Elective	7 to 9	Thesis (Bot. 11)	5
		Elective	3 or 4
	17 to 19		17 to 19

*Women may elect other subjects.

COURSE IN CHEMISTRY.

Options: (a) Agricultural Chemistry; (b) Food Chemistry; (c) Bio-chemistry.

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Trigonometry (Math. 2a)	3	Agricultural Physics (Phys. 1a)	5
General Botany (Bot. 1)	5	Elective	4 to 6
Elective	2 or 3	Military Science (Mil. Sci. 2) or Physical Education (Phys. Ed. 1...)	1
Military Science (Mil. Sci. 1) or Physical Education (Phys. Ed. 1...)	1		
	18 or 19		17 to 19

SOPHOMORE YEAR.

Quantitative Analysis (Chem. 3)	5	Quantitative Analysis (Chem. 3)	5
Expository Composition (Eng. 2)	2	Expository Composition (Eng. 2)	2
Invertebrate Zoology (Zool. 1)	4	Human Physiology and Anat. (Zool. 3)	5
Elective	5 to 7	Elective	4 to 6
Military Science (Mil. Sci. 3) or Physical Education (Phys. Ed. 2...)	1	Military Science (Mil. Sci. 4) or Physical Education (Phys. Ed. 2...)	1
	17 to 19		17 to 19

JUNIOR YEAR.

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Organic Chemistry (Chem. 5)	5	Adv. Organic Chemistry (Chem. 9)	4
Bacteriology (Bact. 12)	5	Sanitary Bacteriology (Bact. 13)	2
Quantitative Analysis (Chem. 4)	4	Quantitative Analysis (Chem. 4)	4
Elective	2 or 3	Elective	5 to 7
	18 or 19		17 to 19

SENIOR YEAR.

Industrial Chemistry (Chem. 14)	5	Physiological Chemistry (Chem. 11)	3
Seminar (Chem. 20)	1	Seminar (Chem. 20)	1
Physical Chemistry (Chem. 19)	4	Water Analysis (Chem. 18)	4
Elective	7 to 9	Elective	9 to 11
	17 to 19		17 to 19

COURSE IN ENTOMOLOGY AND ZOOLOGY.

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
General Botany (Bot. 1)	5	Agricultural Physics (Phys. 1a)	5
Trigonometry (Math. 2a) or Ele. Analysis (Math. 7)	3	Elective	4 to 6
Elective	3	Military Science (Mil. Sci. 2) or Physical Education (Phys. Ed. 1)	1
Military Science (Mil. Sci. 1) or Physical Education (Phys. Ed. 1)	1		
	19		17 to 19

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2	Expository Composition (Eng. 2)	2
Organic Chemistry (Chem. 5)	4	Animal Nutrition (Chem. 11) or Agricultural Chemistry (Chem. 7)	3 to 5
Invertebrate Zoology (Zool. 1)	4	Geology (Geol. 1)	3
*Field Crops (Agron. 1)	4	Systematic Botany (Bot. 2)	4
*Fruit Grow. and Garden. (Hort. 10)	4	Economic Entomology (Ento. 4)	4
Military Science (Mil. Sci. 3) or Physical Education (Phys. Ed. 2)	1	Military Science (Mil. Sci. 4) or Physical Education (Phys. Ed. 2)	1
	19		17 to 19

JUNIOR YEAR.

Advanced Composition (Eng. 3) or English Literature (Eng. 10)	2	Advanced Composition (Eng. 3) or English Literature (Eng. 10)	2
Bacteriology (Bact. 12)	5	Human Physiology and Anat. (Zool. 3)	5
Gen. and Sys. Entomology (Ento. 5)	4	Plant Physiology (Bot. 3)	4
Vertebrate Zoology (Zool. 2)	4	Adv. Economic Entomology (Ento. 6)	4
Elective	2 to 4	Elective	2 to 4
	17 to 19		17 to 19

SENIOR YEAR.

Psychology (Ed. 1a)	3	Sociology (Soc. 4)	3
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Embryology (Zool 13)	4	Plant Pathology (Bot. 4)	4
Thesis (Ento. 10)	5	Thesis (Ento. 10)	5
Elective	3 to 5	Elective	3 to 5
	17 to 19		17 to 19

*Women may elect other subjects.

COURSE IN INDUSTRIAL CHEMISTRY.

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
Algebra (Math. 1)	3	Analytical Geometry (Math. 3)	5
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Trigonometry (Math. 2)	2	Elective	5 or 6
Elective	5 or 6	Military Science (Mil. Sci. 2) or Physical Education (Phys. Ed. 1)	1
Military Science (Mil Sci. 1) or Physical Education (Phys. Ed. 1)	1		
	18 or 19		18 or 19

SOPHOMORE YEAR.

Calculus (Math. 4)	5	Calculus (Math. 4)	4
Engineering Physics (Phys. 1)	3	Engineering Physics (Phys. 1)	3
Physical Measurements (Phys. 2)	2	Physical Measurements (Phys. 2)	2
Quantitative Analysis (Chem. 3)	5	Quantitative Analysis (Chem. 3)	5
Elective	2 or 3	Elective	3 or 4
Military Science (Mil. Sci. 3) or Physical Education (Phys. Ed. 2)	1	Military Science (Mil. Sci. 4) or Physical Education (Phys. Ed. 2)	1
	18 or 19		18 or 19

JUNIOR YEAR.

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Organic Chemistry (Chem. 5)	5	Adv. Organic Chemistry (Chem. 9)	4
Mineralogy (Geol. 2)	3	Sound and Light (Phys. 3)	2
Electricity and Magnetism (Phys. 5)	4	Physical Measurements (Phys. 4)	2
Quantitative Analysis (Chem. 4)	4	Quantitative Analysis (Chem. 4)	4
		Elective	4 or 5
	18 or 19		18 or 19

SENIOR YEAR.

Industrial Chemistry (Chem. 14)	5	Industrial Chemistry (Chem. 14)	5
Physical Chemistry (Chem. 19)	4	Seminar (Chem. 20)	1
Seminar (Chem. 20)	1	Fuel Analysis (Chem. 17)	3
Elective	7 to 9	Elective	8 to 10
	17 to 19		17 to 19

College of Applied Science

COURSES OF INSTRUCTION.

Note.—The Roman numerals I and II, designate the semester in which the course is given. When the course is continous through the year, the abbreviation "Yr." is used.

BOTANY AND BACTERIOLOGY.

Professor, D. B. Swingle. Assistant Professors, H. M. Jennison, H. B. Foote.

Botany and bacteriology are among the sciences most fundamental to agriculture. Through botany we learn of the different kinds of plants, their relationships, structure, nutrition, growth and reproduction, and the fungus parasites responsible for many plant diseases. Through bacteriology, we learn of plant and animal diseases and of important chemical changes brought about by micro-organisms in soil, dairy products, silage and other kinds of organic matter. While botany and bacteriology have other aspects besides those relative to agriculture the latter are especially emphasized here.

The four-year course leading to a degree in botany and bacteriology has two major purposes aside from its disciplinary value. First, to train men for professional career in botany, plant pathology, agricultural bacteriology and related subjects; second, to prepare students for the study of medicine in other institutions. With a judicious selection of electives this is a very good premedical course.

Every effort is made to maintain in this course the high standard found in similar courses of undergraduate work in the larger universities. A number of the best students get the additional opportunity of working in the laboratories of the experiment station, where, in addition to making part of their expenses, they can become familiar with the methods used in research work in this department.

This course is characterized by a liberal amount of work in the other sciences, especially chemistry, and enough elective space for courses in applied agriculture, language, etc.

For Undergraduates.

1. General Botany. I; 5 cr. Prerequisite to other botany courses. Fee $2. Mr. Swingle, Mr. Foote.

Survey of the entire plant kingdom, and under each group of plants is discussed the structure, physiology, evolution, life history and economic significance of representative examples. Lect. 3; lab. 2.

2. Systematic Botany. II; 4 cr. Prerequisite Botany 1. Fee $3. Mr. Swingle, Mr. Foote.

Principles underlying classification and application of principles in laboratory and field; especially Montana plants. Lect. 2; lab. 2.

3. Plant Physiology. II; 4 cr. Prerequisites Botany 1, Physics 1a, Chemistry 5. Fee $3; Deposit $3. Mr. Foote.

Nutrition, growth, reproduction, and movement in plants, especially the higher forms. Lect. 1; lab. 3.

4. Plant Pathology. II; 4 cr. Prerequisites Botany 1, Bacteriology 12. Fee $3. Mr. Swingle.

Plant diseases, including the relations of host and parasites, immunity and susceptibility of host and nature of diseases not caused by parasites. Lect. 1; lab. 3.

11. Thesis. Credits variable to 5 per semester. Fee $1; Deposit $4. Mr. Swingle.

Open to seniors in the botany and bacteriology course, and others who have had sufficient preparation.

12. General Bacteriology. I; 4 or 5 cr. Prerequisites Chemistry 1, one course in botany or zoology. Fee $4; Deposit $3: Mr. Swingle, Mr. Foote.

Structure, physiology and classification of bacteria, their growth in nutrient media and methods of bacteriological technique. Relation of bacteria to agriculture, to human and animal pathology to the arts and industries. Lect. 2; lab. 3.

13. Sanitary Bacteriology. II; 2 cr. Prerequisite Bacteriology 12. Mr. Foote.

Treating of infectious diseases. Sources and modes of infection for self protection and the protection of others. Lect. 2.

14. Microbiology of Waters and Foods. II; 3 cr. Prerequisite Bacteriology 12. Fee $4; Deposit $3. Mr. Foote.

A study of micro-organisms in relation to the sanitary qualities of waters and foods. Lab. 3.

15. Bacteriology and Sanitation. I; 4 cr. Fee $3; Deposit $2. Mr. Swingle.

Graduate Nurses course. Principles of prophylaxis including recent discoveries in immunity and disease transmission. Microscopic and cultural studies and the more important tests and reactions. Lect. 2; lab. 2.

CHEMISTRY.

Professor, W. M. Cobleigh. Assistant Professor, R. H. Bogue. Instructor, E. C. Hytree.

The applications of chemistry to the various phases of agriculture to home economcis, to engineering and to many modern industries makes this an important one in a technical school.

Two college courses in chemistry are offered by the science division:

1. **Chemistry.** Electives are offered in each year of the course in order that the student may adapt his training to one of the following special fields. The student must elect one of the following options:

a. **Agricultural Chemistry.** Electives should be chosen from the various sub-courses in agriculture, biology, chemistry, and language. This will give the student an excellent training in scientific agriculture and prepares for positions in agricultural colleges and experiment stations, and the government service.

b. **Food Chemistry.** Electives should be chosen from home economics courses, biology, chemistry, and language.

c. **Bio-Chemistry.** Electives should be taken mainly from biology, chemistry, and language. This course prepares students for positions in state and municipal food and hygienic laboratories, in water purification works and in sewage disposal plants.

II. **Industrial Chemistry.** In this course engineering, mathematics, physics, and language may be elected as minor subjects. This course prepares students for positions in the manufacturing industries. In the senior year attention will be directed to the importance of industrial chemical research and each student will work on a definite problem of importance in some industry.

For Undergraduates.

1. **General Chemistry.** Yr.; 8 cr. Fee $5; Deposit $3. Mr. Cobleigh, Mr. Bogue, Mr. Hytree and assistants.

Fundamental laws of chemistry and descriptive chemistry of the non-metallic elements. Two sections. Lect. 2; lab. 2.

Section I is for students who offer units in high school chemistry for entrance to the college.

Section II is for students who have had no instruction in chemistry in secondary schools.

The two sections are united the second semester. Chemistry of the metallic elements and qualitative analysis of salts, mixtures, minerals and substances of common interest. Lect. 2; lab. 2.

2. **Elementary Quantitative Analysis.** Yr.; 6 cr. Prerequisite Chemistry 1. Fee $4; Deposit $4. Mr. Bogue.

Designed to meet the requirements of students in engineering, home economics, and agriculture for a brief course in analytical chemistry. Lect. 1; lab. 2.

3. **Quantitative Analysis.** Yr.; 8 or 10 cr. Prerequisite Chemistry 1. Fee $4; Deposit $4. Mr. Bogue.

Typical procedures in gravimetric and volumetric analysis and analytical technique. Theory underlying procedures exhaustively treated and comparative methods studied. Designed for students in chemistry. Lect. 2; lab. 2 or3.

4. Quantitative Analysis. Yr.; 8 cr. Prerequisite Chemistry 3, 5. Fee $4; Deposit $4. Mr. Cobleigh, Mr. Bogue.

A continuation of Chemistry 3. Analysis of organic substances and agricultural products. Elective for students in agriculture and home economics. Lect. 2; lab. 2.

5. Organic Chemistry. I; 4 or 5 cr. Prerequisite Chemistry 1. Fee $4; Deposit $4. Mr. Hytree.

Compounds of aliphatic and aromatic series. Two sections. Lect. 3; lab. 1 or 2.

Section 1 is for students in home economics and agriculture.

Section 2 is for students in chemistry, biology and engineering.

6. Advanced Inorganic Chemistry. Yr.; 6 cr. Prerequisites Chemistry 3, 5. Mr. Bogue.

Study of the elements according to the periodic classification of Mendeleef. Lect .3.

7. Agricultural Chemistry. II; 5 cr. Prerequisite Chemistry 5. Fee $6;Deposit $4. Mr. Bogue.

Composition and reaction of soils, preparation and valuation of fertilizers, insecticides, and fungicides, examination of dairy products, and problems of farm sanitation. Lect. 3; lab. 2.

8. Food Chemistry. II; 3 cr. Prerequisite Chemistry 5. Fee $4; Deposit $4. Mr. Cobleigh.

Composition of foods, food production and preservation, food legislation and inspection. Lect. 2; lab. 1.

9. Advanced Organic Chemistry. II; 4 cr. Prerequisites Chemistry, 3, 5. Fee $4; Deposit $4. Mr. Hytree.

Organic preparations more advanced than Chemistry 5. Chemistry 9 to be taken by all students who make chemistry their major subject. Lect. 2; lab. 2.

11. Physiological Chemistry. II; 3 cr. Prerequisite Chemistry 5, Fee $3; Deposit $3. Mr. Hytree.

Functions of fats, carbohydrates, protein and salts in nutrition together with a study of the chemistry of digestion and metabolism. Lect. 2; lab. 1.

12. Engineering Chemistry. I; 3 cr. Prerequisite Chemistry 1. Fee $3; Deposit $3. Mr. Cobleigh.

Chemistry and production of lime, mortar, cement, refractory materials, iron, steel, and copper. Qualitative and approximate quantitative examinations of the materials listed above as an aid in studying their chemical properties. Lect. 2; lab. 1.

14. Industrial Chemistry. Yr.; 10 cr. Prerequisites Chemistry 3, 4, 5. Fee $4;Deposit $4. Mr. Cobleigh.

General operations common to many chemical industries such as crushing, grinding, calcination, fusion, distillation, crystallization, etc., and the types of machinery used in these operations. Inspection and reports on various industrial plants in the state. Lect. 3; lab. 2.

17. Fuel Analysis. II; 3 cr. Prerequisite Chemistry 3. Fee $4; Deposit $4. Mr. Cobleigh.

Production and analysis of solid, liquid and gaseous fuels, illuminating gas, and lubricating oils. Lect. 1; lab. 2.

18. Water Analysis. I or II; 2 or 4 cr. Prerequisites Chemistry 1 and first semester of Chemistry 3. Fee $4; Deposit $4. Mr. Cobleigh.

Chemical examination of potable waters, of water for industrial purposes and steam raising, of sewages, and of air. Water purification and softening, and sewage treatment. Lect. 1; lab. 1; or lect. 2; lab. 2.

19. Physical Chemistry. I; 4 cr. Prerequisite Chemistry 3. Fee $1.50; Deposit $1.50. Mr. Hytree.

Theoretical chemistry, including the following topics: Stoichometry, the gas laws; kinetic theory of gases, radioactivity, the electron theory, colloids, osmotic pressure, the theory of solution, phase rule, equilibrium in electrolites and electro chemistry. Lect. 3; lab. 1.

20. Seminar. Yr.; 2 cr. Mr. Cobleigh, Mr. Bogue, Mr. Hytree.

Each student will be required to make abstracts of articles on assigned subjects from the leading journals, and present them at weekly meetings of the students and department instructors where the topics are discussed. Lect. 1.

21. Thesis. Yr.; 4 cr. Mr. Cobleigh, Mr. Bogue, Mr. Hytree.

Students in the chemistry course may in the senior year prepare a graduate thesis on some subject which will involve considerable laoratory work and originality. Lab. 2.

22. Inorganic and Organic Chemistry. I; 4 cr. Fee $3; Deposit $3. Mr. Cobleigh.

Graduate Nurses Course. The elementary principles of inorganic and organic chemistry and their applications to a descriptive study of the chemistry of the materials most frequently used by the practicing nurse; the composition, preservation and adulteration of foods; the chemistry of digestion and metabolism, private and public water supplies, sewage disposal problems in unsewered districts, and the priniciples of heating and ventilation. Lect. 3; lab. 1.

ENTOMOLOGY AND ZOOLOGY.

Professor, R. A. Cooley. Assistant Professor, M. H. Spaulding, Mr. H. Seamans.

Taken as a whole the courses in this department are primarily designed to give training in the zoological branches as they are applied in horticulture, agronomy, animal industry, general agriculture, and home economics. They form a basis for an understanding of the various phases of the development of life and the problems of evolution. They throw light on the problems of social science, and are well designed for purposes of general education.

The department is well equipped with the necessary microscopes, microtomes, photographic apparatus and dark rooms and miscellaneous equipment which permit all courses listed to be given in a thorough manner.

The various animal groups are well represented in the collections. In the museum room are about five hundred skins of mammals and birds, while among the study materials is an unusually full series of marine and fresh water invertebrates.

The insect collections are especially large and useful. Many thousands of pinned specimens are arranged in the cabinets and these together with microscopical slides and alcoholic materials constitute one of the best insect collections in the west.

The library contains a very valuable accumulation of books and pamphlets dealing with zoological subjects. It is especially strong in entomological literature. The more important scientific journals of this country and others are regularly received and the library has more or less complete sets of back numbers bound and placed on the shelves.

For Undergraduates.

1. Inverterbrate Zoology. I; 4 cr. Fee $3. Mr. Spaulding.

Invertebrate animals, including their morphology, development. habits, economic or popular interest and classification. Lect. 2; lab. 2.

2. Vertebrate Zoology. I or II; 4 cr. Prerequisite Zoology 1. Fee $3. Mr. Spaulding.

Vertebrate (chordate) animals, treating in detail the structure and relationships of the different groups; their classification and economic importance. Elective to all students. Lect. 2; lab. 2.

3. Human Physiology and Anatomy. II; 5 cr. Prerequisite Zoology 1. Fee $3. Mr. Spaulding.

Lect. 3; lab. 2.

4. Economic Entomology. II; 4 cr. Prerequisite Zoology 1. Fee $2. Mr. Cooley.

Anatomy, metamorphosis and classification of insects; study of the various orders and of the principle families with particular reference to the species of economic importance. Lect. 2; lab. 2.

5. General and Systematic Entomology. I; 4 cr. Prerequisite Entomology 4. Fee $2. Mr. Cooley.

Morphology and classification of insects with some consideration of physiology, development, and adaptations. Lect. 2; lab. 2.

6. Advanced Economic Entomology. II; 4 cr. Prerequisite Entomology 4. Fee $2. Mr. Cooley.

Insect pests and insect control. Lect. 3; lab. 1.

7. Advanced Entomology. Yr.; 6 to 10 cr. Prerequisites Entomology 4, 5, 6. Fee $2. Mr. Cooley.

Individual instruction to fit the students' needs, including systematic, economic, biological, and library work.

8. Embryology. I; 4 cr. Prerequisite Zoology 2, or 3. Fee $3. Mr. Spaulding.

Foundation and growth of tissues in the vertebrate body, based chiefly on a study of the chick, but including consideration of the development in the mamalia. Lect. 1; lab. 3.

9. Organic Evolution. II; 3 cr. Mr. Spaulding.

Evolution theories and their present status; also heredity, variation, natural and artificial selection, adaptations, etc. Lect. 3.

10. Thesis. Credits variable, not to exceed 5. Fee $2 to $10. Mr. Cooley or Mr. Spaulding.

Seniors in this department and seniors from other courses, who have had sufficient previous training may elect this course.

11. Economic Zoology. I; 2 cr. Prerequisite Zoology 1 or 2. Mr. Spaulding.

Discussion of vertebrates of economic importance and devoted chiefly to mammals and birds. Lect. 2.

12. Physiology and Hygiene. I; 4 cr. Fee $3. Mr. Spaulding.

Graduate Nurses course. Dealing with the more important phases of physiology and hygiene supplementing the work already taken, with laboratory work with living tissues. Lectures and demonstrations and laboratory work. Lect. 2; lab. 2.

GEOLOGY.

Assistant Professor, R. H. Bogue.

The subjects of mineralogy and geology are important not only to the student of general science, but also to those who are specializing along some particular applied line. Here the student of agriculture gains an insight into the nature of soil as merely one particular phase of the broader subjects of rock formation, and disintegration, and from his knowledge of rocks, rock forming minerals, and the changes which these minerals undergo gains the ability to classify soils in a systematic manner. The engineer is enabled both to distinguish between the various types of rocks and minerals, and also to foresee how a given constructive material will withstand various conditions of weathering, and other destructive agents. The science student, in any field, finds in geology and mineralogy a history of the nature and origin of all the materials with which he comes in contact, and having command of such data he approaches his subject in a well prepared and intelligent manner.

The department museum, containing an excellent collection of minerals, rocks, and fossils, is constantly drawn upon for illustrative material. In addition, the publications of the United States Geological Survey are at the command of the student, and are used as references in connection with special topics.

For Undergraduates.

1. General Geology. II; 3 cr. Prerequisite Chemistry 1.

Application of the science to agriculture and engineering. Rocks and rock forming minerals and their classification. A trip to Morrison Cave, an interesting formation lying about fifty miles west of Bozeman, will be included in the field work. Lect. 3.

2. Mineralogy. I; 3 cr. Prerequisite Chemistry 1.

Chrystallography, and the classification and identification of the more important minerals and rocks. Lect. 2; lab. 1.

MATHEMATICS.

PROFESSOR, W. D. TALLMAN. INSTRUCTOR, FRIEDA BULL.

The students in this department have access to the following journals: American Journal of Mathematics (complete set); Annals of Mathematics (from 1900); Bulletin of American Mathematical Society (1898 to date); also about 200 volumes of recent treatises on mathematics. It may also be mentioned that our library is especially well equipped with treatises and journals of applied mathematics found in the libraries of the engineering and physics departments.

Those desiring to do work which is not given below may, upon consultation with the professor in charge of the department arrange for other advanced courses, such as theory of functions, projective geometry, etc., if there is sufficient demand.

For Undergraduates.

1. Algebra. I; 3 cr. Mr. Tallman.

Review of radicals and quadratic equations, progressions, arrangements and groups, binominal theorem, theory of limits, undetermined co-efficients, logarithms and introduction to the theory of equations.

2. Trigonometry. I; 2 cr. Miss Bull.

2a. Trigonometry and Logarithms. I; 3 cr. Miss Bull.

3. Analytical Geometry. II; 5 cr. Mr. Tallman.

Geometry of the straight line and conic sections coupled with elements of differential calculus.

4. Calculus. Yr.; 9 cr. Mr. Tallman.

Differential and integral calculus. Problems in analytical geometry not treated in course 3, especially the geometry of three dimensions and an introduction to differential equations.

6. Astronomy. II; 4 cr. Prerequisite Mathematics. 4. Mr. Tallman.

Spherical trigonometry especially applied to astronomical triangle, least squares and probable error and a general survey of descriptive astronomy.

7. Elementary Analysis. I; 3 cr. Mr. Tallman.

Elementary concepts of analytical geometry and calculus of importance to students of the natural sciences and the application of the same to practical problems.

8. Statistics. Yr.; 6 cr. Prerequisites Mathematics 4, 7. Mr. Tallman.

Theory of probability, general methods of statistical investigation, application of the theory of probability to statistical data, fitting curves to obversations, interpolation, theory of errors, mathematical theory of variation and correlation and application of the principles developed to problems in biology, sociology and economics.

10. Differential Equations. Yr.; 6 cr. Mr. Tallman.

Ordinary and partial differential equations with geometrical and mechanical applications.

11. Partial Differential Equations of Mathematics-Physics. Yr.; 6 cr. Mr. Tallman.

Course based on Weber's "Die Partiellen Differential Gleichungender Mathematischen Physic," and Byerley's "Spherical Harmonics."

PHYSICS.

Professor, F. W. Ham. Instructor, J. A. Kiefer.

The following courses in physics are designed to meet the needs of (1) those students who are preparing to take up some of the more technical studies in engineering or agriculture, (2) those who expect to become physics or science teachers, and (3) those general science students who wish to acquire some of that kind of scientific training which is peculiar to the science of physics alone.

For Undergraduates.

1a. Agricultural Physics. II; 5 cr. Prerequisite Mathematics 2 or 2a. Fee $1; Deposit $1. Mr. Ham.

A general course with special emphasis on the fundamental principles of physics important in the different branches of agriculture. Lect. 3; lab. 2.

1. Engineering Physics. Yr.; 6 cr. Mr. Ham.

More mathematical and technical than Physics 1a and particularly designed to meet the needs of students in engineering. Students who have not completed the calculus, mathematics 4, are required to take it during the same year that Physics 1 is taken. Lect. 3.

2. Physical Measurements. Yr.; 4 cr. Fee $1; Deposit $1. Mr. Kiefer.

Laboratory course designed to supplement Physics 1. Lab. 2.

3. Light and Sound. II; 2 cr. Prerequisites Physics 1, 2. Mr. Kiefer.

Theory of light in its application to familiar optical phenomena and to optical instruments. The phenomena and laws of sound. Lect 2.

4. Physical Measurements. II; 2 cr. Fee $1; Deposit $1. Mr. Kiefer.

Laboratory course in light and sound to supplement physics 3.

5. Electricity and Magnetism. I; 4 cr. Prerequisites Physics 1, 2, Mathematics 4. Fee $1; Deposit $1. Mr. Ham.

Methods for the exact measurements of resistance, electromotive force, current, capacity, and the coefficient of self-induction. Calibration of commercial instruments, insulation testing, and magnetic measurements. Lect. 2; lab. 2.

6d. Pedagogy of Physics. I or II; 3 cr. Prerequisites Physics 1, 2, 3, 4. Mr. Ham.

Methods of teaching, the selection and performance of effective lecture table and laboratory experiments and practice in presenting the topics covering such experiments to elementary and college classes. Lect. 3.

9. Household Physics. I; 3 cr. Fee $1; Deposit 1. Mr. Ham.

A general course including the physics of ventilation, the lighting and heating of houses and other physical phenomena of interest to the housekeeper. Lect. 2.; Lab. 1.
physics. Mr. Ham.

Sources and measurement of atmospheric temperature, pressure and circulation of the atmosphere, measurement and movement of moisture, cause and prevention of frost. Part of the course will consist of a study of Montana weather bulletins. Lect. 3.

11. Electron Theory. II; 2 cr. Prerequisites Mathematics 4. 10 credits of college physics. Mr. Ham.

Graduate course open to undergraduates who can satisfy the prerequisites. Not a survey course but a discussion of recent research work. Lect. 2.

College of Household and Industrial Arts

The purpose of each of the courses in the College of Household and Industrial Arts is indicated by its title. The industrial application of the work is emphasized in each course. The applied art course and secretarial work are open equally for men and women. Several subjects taught in departments not represented in the College of Household and Industrial Arts are open to election by students on consent of their adviser.

COURSE IN APPLIED ART.

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
German (German 1) or German (German 3) or French (French 1)	4	German (German 1) or German (German 3) or French (French 1)	4
General Botany (Bot. 1)	5	Cooking (H. E. 1)	4
Freehand Drawing (Art 1)	2	Design Art 7)	3
Sewing (H. E. 11)	3	Handicraft (Art 10-11-12-13)	2
Physical Education (Phys. Ed. 1)	1	Painting (Art 2)	2
		Physical Education (Phys. Ed. 1)	1
	18		19

SOPHOMORE YEAR.

English Literature (Eng. 10)	2	English Literature (Eng. 10)	2
German (German 2) or German (German 4) and German (German 6) or French (French 2)	4	German (German 2) or German (German 4) and German (German 6) or French (French 2)	4
History of Art (Art 6)	3	History of Art (Art 6)	3
Freehand Drawing (Art 1a)	2	Freehand Drawing (Art 1a)	2
Historic Ornament (Art 7a)	2	Historic Ornament (Art. 7a)	2
Painting (Art 2)	2	Human Phys. and Anat. (Zool. 3)	5
Handicraft (Art 10-11-12-13)	2	Physical Education (Phys. Ed. 2)	1
Physical Education (Phys. Ed. 2)	1		
	18		19

JUNIOR YEAR.

The Modern Drama (Eng. 6)	2	The Modern Drama (Eng. 6)	2
Advanced Design (Art 7b)	2	Advanced Design (Art 7b)	2
Household Physics (Phys. 9)	3	Medieval History (Hist. 2)	3
Medieval History (Hist. 2)	3	Freehand Drawing (Art 1b)	2
Freehand Drawing (Art 1b)	2	Painting (Art 2a)	2
Painting (Art 2a)	2	Handicraft (Art 10-11-12-13)	2
Handicraft (Art 10-11-12-13)	2	Composition (Art 16)	2
Perspctive (Art 15)	2	Elective	3 or 4
	18		18 or 19

SENIOR YEAR.

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Psychology (Ed. 1a)	3	Sociology (Soc. 4)	3
Advanced Design (Art 7c)	2	Advanced Design (Art 7c)	2
Thesis (Art 19)	4	Thesis (Art 19)	4
Elective	6 to 8	Elective	6 to 8
	17 to 19		17 to 19

COURSE IN HOME ECONOMICS.

Note If Chemistry is elected Art (8b) and Bacteriology (13) should be taken in the senior year.

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
German (German 1) or German (German 3) or French (French 1)	4	German (German 1) or German (German 3) or French (French 1)	4
Modern History (Hist. 7) or Trigonometry (Math. 2a)	3 or 4	Food Preparation (H. E. 1)	4
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
Clothing (H. E. 11)	3	Design (Art 7)	3
Physical Education (Phys. Ed. 1)	1	Physical Education (Phys. Ed. 1)	1
	18 or 19		19

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2	Expository Composition (Eng. 2)	2
German (German 2) or German (German 4) and German (German 6) or French (French 2)	4	German (German 2) or German (German 4) and German (German 6) or French (French 2)	4
Organic Chemistry (Chem. 5)	4	Food Chemistry (Chem. 8)	3
Invertebrate Zoology (Zool. 1)	4	Food Studies (H. E. 2)	4
Dressmaking (H. E. 12)	2	Human Phys. and Anat. (Zool. 3)	5
The Home (H. E. 3)	2	Physical Education (Phys. Ed. 2)	1
Physical Education (Phys. Ed. 2)	1		
	19		19

JUNIOR YEAR.

Economics (Econ. 3)	2	Economics (Econ. 3)	2
Bacteriology (Bact. 12)	5	Costume Design (H. E. 15)	2
Textiles (H. E. 13)	2	Textiles (H. E. 13)	2
Problems in Food Preparation (H. E. 4)	2	Dress Design (H. E. 14)	3
Household Physics (Phys. 9)	3	Sanitary Bacteriology (Bact. 13) or Quantitative Analysis (Chem. 2))	2 or 3
Household Decoration (Art 8b).. or Quantitative Analysis (Chem. 2)..)	2 or 3	Household Management (H. E. 7)	3
Elective	1 or 2	Physiological Chemistry (Chem. 11)	3
		Elective	0 or 1
	17 to 19		17 to 19

SENIOR YEAR.

Psychology (Ed. 1a)	3	Sociology (Soc. 4)	3
Hist. of Home Economics (H. E. 9)	2	Teaching Home Economics (H. E. 8)	4
Dietetics (H. E. 6)	4	Home Problems (H. E. 10)	3 to 5
Art Needle Work (H. E. 16)	2	Science or History	2 to 4
Embroidery Design (Art 8a)	2	Elective	5 to 3
Science or History	2 to 4		
Elective	2		
	17 to 19		17 to 19

COURSE IN SECRETARIAL WORK.

FRESHMAN YEAR.

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
German (German 1) or	4	German (German 1) or	4
German (German 3) or		German (German 3) or	
French (French 1)		French (French 1)	
European History (Hist. 1)	3	European History (Hist. 1)	3
General Chemistry (Chem. 1)	4	General Chemistry (Chem. 1)	4
*Algebra (Math. 1)	3	Business Proceedure (Sec. 5)	3
Military Science (Mil. Sci. 1) or	1	Military Science (Mil. Sci. 2) or	1
Physical Education (Phys. Ed. 1)		Physical Education (Phys. Ed. 1)	
	18		18

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2	Expository Composition (Eng. 2)	2
German (German 2) or German (German 4) and German (German 6) or	4	German (German 2) or German (German 4) and German (German 6) or	4
French (French 2)		French (French 2)	
Industrial History (Hist. 10)	3	Industrial History (Hist. 10)	3
Shorthand (Sec. 1)	4	Shorthand (Sec. 1)	4
Typewriting (Sec. 3)	4	Typewriting (Sec. 3)	4
Military Science (Mil. Sci. 3) or	1	Military Science (Mil. Sci. 4) or	1
Physical Education (Phys. Ed. 2)		Physical Education (Phys. Ed. 2)	
	18		18

JUNIOR YEAR.

English Literature (Eng. 10)	2	English Literature (Eng. 10)	2
Office Practice (Sec. 6)	2	Office Practice (Sec. 6)	2
American History (Hist. 5)	3	American History (Hist. 5)	3
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Psychology (Ed. 1a)	3	Commercial Law (Sec. 8)	3
Shorthand (Sec. 2)	3	Shorthand (Sec. 2)	3
Typewriting (Sec. 4)	3	Typewriting (Sec. 4)	3
	18		18

SENIOR YEAR.

Economics of Business (Sec. 7)	3	Sociology (Soc. 4)	3
Business Statistics (Sec. 20)	2	Business Statistics (Sec. 20)	2
Accounting (Sec. 9)	3	Accounting (Sec. 9)	3
Shorthand (Sec. 11)	2	Shorthand (Sec. 11)	2
Typewriting (Sec. 12)	3	Typewriting (Sec. 12)	3
Elective	3 to 6	Elective	3 to 6
	16 to 19		16 to 19

*Women may elect Sewing (H. E. 11)

COURSE IN TWO-YEAR SECRETARIAL WORK.

FIRST YEAR

First Semester		Second Semester	
English Composition (Eng. 1)	3	English Composition (Eng. 1)	3
Office Practice (Sec. 6)	2	Office Practice (Sec. 6)	2
Business Statistics (Sec. 20)	2	Business Statistics (Sec. 20)	2
*Algebra (Math. 1)	3	Business Procedure (Sec. 5)	3
Shorthand (Sec. 1)	4	Shorthand (Sec. 1)	4
Typewriting (Sec. 3)	4	Typewriting (Sec. 3)	4
Military Science (Mil. Sci. 1) or Physical Education (Phys. Ed. 2)	1	Military Science (Mil. Sci. 2) or Physical Education (Phys. Ed. 1)	1
	19		19

SECOND YEAR

Expository Composition (Eng. 2)	2	Expository Composition (Eng. 2)	2
European History (Hist. 1)	3	European History (Hist. 1)	3
Accounting (Sec. 9)	3	Accounting (Sec. 9)	3
Shorthand (Sec. 2)	3	Shorthand (Sec. 2)	3
Typewriting (Sec. 4)	3	Typewriting (Sec. 4)	3
Elective	3	Elective	3
Military Science (Mil. Sci. 3) or Physical Education (Phys. Ed. 1)	1	Military Science (Mil. Sci. 4) or Physical Education (Phys. Ed. 2)	1
	18		18

*Women may elect Sewing (H. E. 11)

College of Household and Industrial Arts

COURSES OF INSTRUCTION.

Note—The Roman numerals I and II designate the semester in which the course is given. When the course is continuous through the year, the abbreviation, "Yr." is used.

APPLIED ART.

Assistant Professor, Lana Baldwin. Instructor, Muriel Moore.

The applied art course is outlined to give a thorough training in drawing and in the use of color. The object of the study being to prepare students for studio work as designers, craftsmen, or decorators, and also to prepare them to teach drawing and handicraft in elementary, grammar, and high schools. The course includes the study of line, form, color, historic ornament, principles of design and composition and technical methods in applied design. It insures a broad foundation of art culture and skill which will enable students to make

practical use of their training. Exceptional facilities are offered for the study of design and composition and the course is strengthened by the many phases of related art work. Every effort is made to teach drawing. The pupil is then encouraged to follow any line of art work for which he seems best fitted. Applied design, interior decoration, handicraft work or teaching.

For Undergraduates.

1. Freehand Drawing. Yr.; 4 cr. Fee $.50. Miss Moore.

Drawing from the cast in charcoal, pencil, or pen and ink. Lab. 2.

1a. Freehand Drawing. Yr.; 4 cr. Fee $.50. Miss Moore.

Continuation of Art 1. Lab. 2.

1b. Freehand Drawing. Yr.; 4 cr. Fee $.50. Miss Moore.

Continuation of Art 1. Lab. 2.

2. Painting. Yr.; 4 cr. Prerequisite Art 1. Fee $.50. Miss Baldwin.

Water color, oils and tempera. Work from nature and still life. Lab. 2.

2a. Painting. Yr.; 4 or 8 cr. Fee $.50. Miss Baldwin.

Continuation of Art 2. Lab. 2 or 4.

3. Architectural Drawing. II; 2 cr. Fee $.50. Miss Moore.

Drawing from still life and casts. Study of architectural details, and sketching from nature. Work executed in pencil, pen and ink, and charcoal. Lab. 2.

3a. Architectural Drawing. Yr.; 4 cr. Prerequisite Art 3. Fee $.50. Miss Baldwin.

Continuation of Art 3. Problems in composition and design. Work executed in pencil, charcoal, wash, and color. Lab. 2.

4. Drawing from Nature. I or II; 2 cr. Fee $.50. Miss Moore.

Pencil, pen and ink, wash and color. Intended especially for students in biology. Lab. 2.

6. History of Art. Yr.; 6 cr. Miss Baldwin.

Intended especially for students in design. Historic ornament and the classic styles as exemplified in painting, sculpture and architecture. (Not offered in 1917-18.) Lect. 3.

7. Design. II; 3 cr. Fee $.50. Miss Baldwin.

Applied design and use of water colors. Students submit original designs. Lect. 1; lab. 2.

7a. Historic Ornament. Yr.; 4 cr. Prerequisite Art 7. Fee $.50. Miss Baldwin.

Historic ornament with analysis of historic examples of design. Original problems executed in black and white and in color. Lab. 2.

7b. Advanced Design. Yr.; 4 cr. Fee $.50. Miss Baldwin.

Original designs for commercial purposes executed to meet the requirements and conditions of reproduction. Lab. 2.

7c. Advanced Design. Yr.; 4 to 8 cr. Fee $.50. Miss Baldwin.

Continuation of 7b. Lab. 2 or 4.

8a. Embroidery Design. I; 2 cr. Fee $.50. Miss Baldwin.

Theory of color and design; original designs for embroidery. Lab. 2.

8b. Household Decoration. I; 2 cr. Fee $.50. Miss Baldwin.

Color, line, and form as applied to house furnishings. Lect. 1; lab. 1.

8c. Decorative Periods. Yr. 4 cr. Prerequisite Art 8b. Fee $.50. Miss Baldwin.

Advanced work in interior decoration. Decorative styles and their adaption to modern uses. Original designs for interiors executed in color. Lab. 2.

9. China Design. Yr.; 4 cr. Fee $.50. Miss Moore.

Applied design for decoration of china; study of color. Lab. 2.

10. Painting on China. Yr.; 4 cr. Fee $6. Miss Moore.

China is fired in the studio. Lab. 2.

11. Leather. Yr.; 4 cr. Prerequisite Art 7. Fee $3. Miss Baldwin.

Tooling, modeling and embossing; also use of dyes and stains for leather. Lab. 2.

12. Jewelry. Yr.; 4 cr. Fee $4. Miss Baldwin.

Making of simple and unique jewelry in gold, silver, and in copper. Sawpiercing, enameling, repousse and the setting of semi-precious stones. Lab. 2.

13. Metal. Yr.; 4 cr. Fee $3. Miss Baldwin.

Work in copper, brass, and silver. Raising, sawpiercing, etching, hard and soft soldering and riveting. Given alternate years, 1917-18. Lab. 2.

14. Basketry. II; 1 cr. Miss Baldwin.

Making of baskets of reeds and raffia and other suitable materials. Dyes and dying baskets. Use of native materials in original work in basketry. Lab. 1.

15. Perspective. I; 2 cr. Fee $.50. Miss Moore.

Principles of angular and parallel view perspective taught by means of freehand sketches and drawings. Work executed in pencil, pen and ink, wash and color. Lect. 1; lab. 1.

16. Composition. II; 2 cr. Fee $.50. Miss Moore.

Art structure as a means of expression. Original compositions in light and dark, line and color. Lect. 1; lab. 1.

17. Practice Work in Teaching. Yr.; 4 cr. Miss Baldwin.

Teaching drawing, painting, design, and handicrafts.

18a. Methods. I; 2 cr. Fee $.50. Miss Moore.

Methods of teaching drawing, painting and design. Lesson plans and materials. Lect. 1; lab. 1.

18b. Methods. II; 2 cr. Fee $.50. Miss Baldwin.

Methods of teaching the handicrafts; metal, jewelry, leather, basketry, wood block painting, and stenciling. Lesson plans. Materials and equipment. Lect. 1; lab. 1.

19. Thesis. Yr.; 8 cr. Fee $1 to $5. Miss Baldwin.

ECONOMICS AND SOCIOLOGY.

Professor, J. M. Hamilton (President). Mr.....

2. Economics. Yr.; 4 cr. Mr. Hamilton.

Prinicples of economic science, study of some important problems of today, such as labor and capital, banking, transportation and taxation.

4. Sociology. II; 3 cr. Mr. Hamilton.

Introduction to sociology. Attention given to such social problems as marriage and divorce, immigration, race questions, charities and corrections, pauperism and crime.

5. Engineering Economics. I; 3 cr. Prerequisite Economics 3. Mr.....

Study of economic questions of immediate interest to engineers and others engaged in the industries.

6. Agricultural Economics. II; 3 cr. Prerequisite Economics 3. Mr.

Agricultural economic problems; value and rent of land; agricultural labor; rural credit; cooperative associations.

7. Rural Sociology. I; 3 cr. Prerequisite Sociology 4. Mr.

Rural social problems; rural health; country church; rural schools; roads; recreations, etc.

ENGLISH.

Professor, W. F. Brewer, Mrs. Una Herrick (Dean). Assistant Professor, E. A. Duddy. Instructor, Mignon Quaw. Mr. G. S. Powell.

In all the courses in English, written work plays an important part. That this work may be kept up to the proper grade, it is announced here that in college English work no paper will receive any credit that shows notable carelessness or ignorance in elementary matters of punctuation, grammar, rhetoric, or in the spelling of common words.

For Undergraduates.

1. English Composition. Yr.; 6 cr. Mr. Brewer, Mr. Duddy, Miss Quaw.

Required of all freshmen. Rhetoric and types of prose composition; narration, description, exposition, and argumentation. Five or more sections. The course may be begun or completed in either semester.

2. Expository Composition. Yr.; 4 cr. Mr. Brewer.

Intended for students who will go into scientific or technical work; with a steady practice in writing, a considerable variety of reading is required in both semesters. Practice in the use of the library. Three or more sections. This course may be begun in either semester, and after the year 1917-1918 may be completed in either semester.

3. Advanced English Composition. Yr.; 4 cr. Mr. Brewer.

Open to juniors and seniors. Systematic reading. Methods of the course will be varied to suit the immediate purpose of those who elect it.

5. Argumentation and Forms of Public Address. Yr.; 4 cr. Mr. Duddy.

First semester is a study of the principles of argumentation with written and oral application in briefs, forensics, and debates. Second semester, a study of the forms of public address with written and oral practice. Electives for seniors, juniors, and sophomores who have credit for courses 1 and 2. At the pleasure of the instructor, sophomores who are taking English 2 may also elect course 5.

6. The Modern Drama. Yr.; 4 cr. Prerequisite English 1. Mrs. Herrick.

Survey of the modern drama in Europe and America, with emphasis on influence of Ibsen and Shaw. Elective for juniors and seniors. With the consent of the instructor it may be taken in either semester separately.

10. English Literature. Yr.; 4 cr. Mr. Brewer.

General survey course. Large amount of reading is required and more recommended. Written reports. Class room critical reading of English masterpieces. Lectures, recitations and conferences.

FRENCH AND SPANISH.

Instructor, Florence Wallin.

For Undergraduates.

1. French. Yr.; 8 cr.

Elements of grammar based on Fraser and Squairs' French Grammar, with constant practice in pronunciation, dictation and conversation. Reading of easy texts.

2. French. Yr.; 8 cr.

Review of grammar. Typical fiction and dramas of the nineteenth century. Advanced composition and original theme writing. Conversation and dictation.

3. French. Yr.; 6 cr.

Study of classic French literature of the seventeenth and eighteenth centuries, such as Corneille, Racine, Moliere, LeSage and Voltaire. Collateral reading and reports. Lyric poetry.

20. Spanish. Yr.; 8 cr.

Elements of grammar with conversation and special emphasis on pronunciation. Reading of short stories and easy novels.

21. Spanish. Yr.; 4 cr.

Reading of modern novelists and dramatists. Conversation and composition.

GERMAN.

ASSISTANT PROFESSOR, CARRIE CEHRS.

For Undergraduates.

1. Elementary German. Yr.; 8 cr.

Grammar and easy readings, with practice in speaking and writing German. Open to college students who have not had high school or preparatory German.

2. Intermediate German. Yr.; 8 cr. Prerequisite German 1.

Modern prose, narrative and dramatic. Grammar review and elementary syntax, written and oral exercises.

3. Advanced Freshman German. Yr.; 8 cr.

Classical and modern writers. Selected works of Schiller, Heine, Freytag, Sudermann and others. Conversation, composition and syntax. Open to freshmen who have had two years of high school German.

4. Classics of the Eighteenth Century. Yr.; 4 cr.

Masterpieces of Lessing, Goethe and Schiller. (Given in 1917-1918.)

5. Modern German Dramatists. Yr.; 4 cr.

Selected dramas of Grillparzer, Hebbel, Sudermann, Hauptmann, and others. A rapid reading course. (Omitted in 1917-18.)

6. Scientific German. Yr.; 4 cr. Prerequisites German 1, 2.

For students specializing in science. Rapid reading of scientific prose.

HISTORY.

ASSISTANT PROFESSOR, HELEN BREWER.

For Undergraduates.

1. European History. Yr.; 6 cr.

The development of modern Europe. Use of the library with lectures on historical methods.

2. Medieval History. Yr.; 6 cr. Alternates with History 5.

First semester is devoted to topical study with library references; second semester, to Italy, and the Renaissance with text-book, and pictures.

5. American History. Yr.; 6 cr. Prerequisite History 1. Alternates with Medieval History 2.

United States history covering the period of constitutional development. Use of the library is required, and the student is expected to spend about one-fourth time in the preparation of a paper. (Not given in 1917-18).

7. Modern History. I; 4 cr.

Current events, a review of the political and industrial development of the last few decades.

10. Industrial History. Yr.; 6 cr. Prerequisite History 1.

Outlines of United States Industrial history. Each semester the student will write a paper on some special line of industry which he either reads upon or personally investigates.

HOME ECONOMICS.

Professor, Lilla Harkins. Assistant Professors, Florence Ballinger, Carlotta Ford. Instructor, Amy Rolfe.

The object of this course is two-fold. First, to give young women a liberal education with a scientific basis, and to train them along lines pertaining to science, management and care of the home. Second, to give training to those who wish to become teachers of home economics or dietians.

In the junior and senior years there is cosiderable opportunity for electives. These must be taken with the advice and approval of the class adviser. Students who wish to specialize in foods and nutrition may elect pure science, advanced food studies, therapeutic cookery, and demonstration course. Those who wish to specialize in domestic art may elect art, history, and millinery. Four to eight credits must be elected during the senior year in physics, chemistry, botany, biology, or history. Those who expect to teach will take home economics 8.

For Undergraduates.

1. Food Preparation. II; 4 cr. Fee $4. Miss Harkins.

Selection and preparation of foods. Marketing and care of food materials. More advanced work is given to students who have had high school courses in cooking. Lect. 1; lab. 3.

2. Food Studies. II; 4 cr. Fee $5. Prerequisites Home Economics 1, Chemistry 1, 5. Miss Ford.

Application of the science underlying the selection and preparation of foods. The dishes prepared illustrate the scientific principles involved. Lect. 2; lab. 2.

3. The Home. I; 2 cr. Miss Harkins.

Evolution of the home, modern houses; practice in drawing floor plans of houses; economic problems in furnishing. Lect. 2.

4. Problems in Food Preparation. I; 2 cr. Prerequisites Home Economics 1, 2. Fee $5. Miss Harkins.

Menus are planned and meals prepared. Lab. 2.

5. Advanced Food Studies. I; 2 cr. Fee $4. Prerequisites Home Economics 6, Chemistry 11, Bacteriology 12, Physics 9. Miss Ford.

Detailed study of the food principles correlating closely with the work in bacteriology, physics, chemistry, biology and physiology. Lab. 2.

6. Dietitics. I; 4 cr. Prerequisites Home Economics 2, Chemistry 5, Bacteriology 12. Fee $4. Miss Ford.

Human nutrition and metabolism, the relation of food to health and disease, and the construction and preparation of dietaries. Lect. 2; lab. 2.

7. Household Management. II; 3 cr. Fee $.50. Miss Harkins.

Purpose of the household, household income, household account and records. Lectures on nursing by a trained nurse. Lect. 3.

8. Teaching Home Economics. II; 4 cr. Fee $.50. Miss Harkins, Miss Ballinger.

Theory and practice of teaching domestic science and domestic art. Study is made of courses of study in various types of institutions. Courses of study are planned for graded schools, high schools and colleges. Lesson plans are given especial attention. Lect. 3; lab. 1.

9. History of Home Economics. I; 2 cr. Miss Harkins.

Survey of women's education, origin and development of home economics. Lect. 2.

10. Home Problems. II; 3 to 5 cr. Deposit $.50 to $6. Miss Ford.

Individual work is required. The student is given opportunity to carry on original or suggested investigation in food work, or along economic lines pertaining to some phase of the home. Open to seniors only.

11. Clothing. I; 3 cr. Fee $2. Miss Ballinger, Miss Rolfe.

Brief study of materials; cost and care of clothing; constructive processes and their application to garments, and drafting patterns to individual measurements. Special attention is given to different machines and their attachments. Lab. 3.

12. Dressmaking. I; 2 cr. Fee $1. Miss Ballinger.

Fundamental principles of dressmaking; modeling and draping patterns to suit individual figures and their applications to dress. Lab. 2.

13. Textiles. Yr.; 4 cr. Prerequisites Chemistry 1, Home Economics 11, 12. Fee $1. Miss Rolfe.

Study of fabrics, beginning with their place in primitive life and tracing their development, manufacture and economic value up to the present time. Methods of determining pure and adulterated fabrics and the chemistry of dry cleaning, dyeing and laundry processes. Lect. 1; lab. 1.

14. Dress Design. II; 3 cr. Fee $1. Miss Ballinger.

Construction of afternoon and evening dresses from original designs. To be taken parallel with Home Economics 15. Lab. 3.

15. Costume Design. II; 2 cr. Fee $2. Miss Rolfe.

Original adaptations of historic costume to modern dress. Study of design, color and texture suitable to various types of individuals and to occasion. Discussion of economic problems in the purchase of ready-to-wear clothing. Lab. 2.

16. Art Needlework. I; 2 cr. Fee $1. Miss Ballinger.

Decoration of household linens and wearing apparel. Must be taken parallel with Art 8a. Lab. 2.

17. Millinery. II; 2 cr. Fee $2. Miss Ballinger.

Construction and trimming of hats. Lab. 2.

18. Observation and Practice Teaching. Yr.; 4 cr. Miss Harkins.

Practice teaching in the Bozeman public schools, the high school, the Deaconess' Hospital, or the College, in domestic art and domestic science.

19. Therapeutic Cookery. II; 1 cr. Fee $1. Miss Ford.

Setting the tray and preparation of food adapted to requirements of abnormal cases. Lab. 1.

21. Food Demonstration. I; 2 cr. Fee $2.50. Miss Harkins.

The theory and practice of food demonstration. Required in the junior and senior years of the Teachers' Course in Home Economics. Elective for other home economics students in the junior and senior years. Lab. 2.

22. Food Preparation. I; 2 cr. Fee $3. Miss Harkins.

Selection and preparation of foods. Lab. 2.

23. Dietetics. I; 4 cr. Fee $4. Miss Ford.

The nutritive value of foods; the fundamentals of nutrition in so far as the students' knowledge of chemistry and biology permit; the planning and serving of diets suitable in health and in disease. Lect. 2; lab. 2.

24. School and Public Health Nursing. I; 2 cr. Miss Harkins.

Methods in successful school nursing work and in nursing for institutions, corporations and other organizations. Lect. 2.

MILITARY SCIENCE.

PROFESSOR, CAPTAIN H. C. CLARK. INSTRUCTOR, SERGEANT, F. BLOSS.

An infantry unit, senior division, of the Reserve Officers' Training Corps has been established at this college by the President of the United States, under the provisions of the National Defense Act of 1916. The primary object is to qualify, by systematic and standard methods of training, students at civil educational institutions for reserve officers, this to be done with the least practicable interference with their civil careers. An officer of the army is detailed by the War Department as Professor of Military Science and Tactics; he also acts as Commandant of Cadets.

By law the military course is compulsory for all physically fit male students, not aliens, during their first two years; the minimum time required is three hours per week, and satisfactory completion of the course is a prerequisite for graduation. The military course is optional for students after their sophomore year; those who elect to continue must agree in writing to continue in the Reserve Officers' Training Corps during the remaider of their course in college, to devote five hours per week to it, and to pursue the courses of camp training that may be prescribed by the Secretary of War. In consideration of this agreement the government purposes to pay the cadet so electing to continue his military studies a sum of money not to exceed the cost of the garrison ration; this is now approximately thirty cents a day. Cadets completing the four years military course will be eligible for appointment in the army as temporary second lieutenant for six months, with a pay of $100 per month and allowances of a regular second lieutenant. The graduate will also be eligible for appointment as a reserve officer.

The college is put to no expense for the military instruction other than proper housing for indoor drill and for government property furnished. The government furnishes the necessary services of officers and non commissioned officers, and uniforms and equipments for the cadets.

For Undergraduates.

1. Military Science. I; 1 cr. Captain Clark.

(a) Practical. Physical drill; infantry drill; close and extended order; gallery practice; care of rifle and equipment.

(b) Theoretical. Theory of target practice; military organization; map reading; security; hygiene. Lect. 3.

2. Military Science. II; 1 cr. Captain Clark.

(a) Practical. Physical drill; infantry drill; intrenchments; first aid; target practice.

(b) Theoretical. Lectures; general military policy and obligations of citizenship; service of information; combat; infantry drill; camp sanitation. Lect. 3.

3. Military Science. I; 1 cr. Captain Clark.

(a) Practical. Same as Course 2 (a). Combat firing if practicable.

(b) Theoretical. Infantry drill regulations; small-arms firing regulations; lectures as in Course 2 (b); map reading; camp sanitation and camp expedients. Lect. 3.

4. Military Science. II; 1 cr. Captain Clark.

(a) Practical. Same as Course 2 (a). Signaling; first aid; intrenchments, field works, obstacles, bridges, etc.; range practice.

(b) Theoretical. Lectures, recent military history; small tactical problems; marches and camps. Lect. 3.

5. Military Science. I; 1 cr. Captain Clark.

(a) Practical. Duties consistent with rank. Military sketching.

(b) Theoretical. Minor tactics; field orders; map maneuvers; company administration; military history. Lect. 5.

6. Military Science. II; 1 cr. Captain Clark.

(a) Practical. Same as Course 5 (a). Military sketching.

(b) Theoretical. Minor tactics continued; map maneuvers; elements of international law; property accountability. Lect. 5.

7. Military Science. I; 1 cr. Captain Clark.

(a) Practical. Duties consistent with rank. Military sketching.

(b) Theoretical. Tactical problems, small forces; court-martial proceedings; international relations of America; general principles of strategy. Open to students ranking as seniors in the college. Lect. 5.

8. Military Science. II; 1 cr. Captain Clark.

(a) Practical. Same as Course 7 (a).

(b) Theoretical. Tactical problems continued; map maneuvers; rifle in war. Lectures on military history and policy. Open to students ranking as seniors in the college. Lect. 5.

MUSIC.

Professors, A. H. Currier, G. W. Nash. Instructors, June Hartman, F. Jackson, L. Howard.

There is a universal demand that education in music shall be provided for in schools and colleges. Some knowledge of applied music is coming to be more and more a part of liberal culture and the valuable influence of good music in family and social life needs no discussion.

Accordingly the department of music offers to students of the college and others opportunity to pursue under competent instructors the main branches of music study.

Tuition is payable to the secretary of the college in advance. No reduction will be made for absence from lessons or for lessons discontinued. Teachers will make up hours they fail to give according to schedule.

Non-resident students of music must be enrolled in other work,

so that the total amount is equal in time spent to eighteen credits. For such students is recommended the study of home economics, languages literature, history, and art.

The department is closed on the college and national holidays. Lessons falling on these days will not be made up.

No student is permitted to take part in any public performance without consent of the director.

Students of this department will be granted certificates, if desired, testifying to quality and amount of work done.

Recitals are given from time to time by the instructors and advanced students to which admision is free.

Music to a total of not more than four credits may be counted toward a degree in those courses which allow free electives. To those regular students who elect music the college will furnish free one thirty-minute lesson a week during the junior and senior years, or either semester of either year; and the work may be elected in either vocal or instrumental music.

PIANO DEPARTMENT

The instruction in piano will comply with the special needs of each individual student, and the courses of music given them to study, will be taken from the works of such standard composers as are recognized by the leading musicians and musical institutions of the world. Specimen programs illustrating the class of music taught will be sent to anyone interested by the department. Elementary harmony is given with the piano lessons as an aid to the analysis of each piece, which is so necessary in memorizing.

Ensemble and Sight Reading.

In this branch of instruction lie indispensable elements of musical knowledge and culture. Ensemble playing develops the students' ability in reading at sight, and enables them to acquire an acquaintance with the masterworks of symphonic and orchestral literature, which is ordinarily inaccessible to the music student.

Theory.

Courses in harmony and musical history will be given if the demand justifies.

VOCAL DEPARTMENT.

The training and development of the voice proceed hand in hand with the acquisition of musical taste and intelligence. Methods are adapted to individual needs. The voice is trained for correct placement, artistic tone, flexibility and agility. The possibilities of varied tone qualities for expressional purposes are emphasized and illustrated. The study of vocal technique includes the subjects of breathing, resonance, tone color, correct attack, sustained tones, scales, arpeg-

gios, legato, staccato, embellishments. Various exercises are used. Attention is given to elegance of diction.

The cultivation of musical taste and artistic interpretation is effected by study of the best modern and classic art songs, operatic arias, and oratorio selections. The art of singing is a complex one as so much depends on the intellectual and emotional status of the singer. Hence the singer should aim to acquire general culture, appreciation of the beautiful in the world of thought and emotion as well as in the realm of sound.

VIOLIN DEPARTMENT

The aim of the department is the acquisition of thorough technique and the study of the works of the best masters. Ensemble playing forms an important part of the course.

MUSICAL ORGANIZATIONS

Four musical organizations furnish both instruction for their members and entertainment for college functions.

College Band. The college band of forty-five members, under the instruction of Mr. Louis Howard, is one of the best amateur musical organizations in the state. The college provides instruments, music and instruction. The band is divided into two sections, beginners and experienced players. This gives a splendid opportunity for those who have never played and those who have some skill in the use of instruments.

The Orchestra. All violin students who are sufficiently advanced are admitted to the college orchestra, and, inasmuch as the orchestra is under the personal direction of the violin instructor, it is of a decided advantage to the violin students.

Treble Clef Club. This is a chorus of about twenty voices, open to college women upon examination.

Glee Club. A male Chorus of about sixteen members. These clubs study both popular and high class music, and afford their members diversion and musical training.

TUITION.

Piano With Mr. Nash.

One half hour lesson per week for one semester	$22.00
Two half hour lessons per week for one semester	40.00
Ensemble playing per semester	10.00

Piano With Miss Hartman.

One half hour lesson per week for one semester	$18.00
Two half hour lessons per week for one semester	34.00

Voice With Mr. Currier.

One half hour lesson per week for one semester.....$22.00
Two half hour lessons per week for one semester..... 40.00

Violin With Mr. Jackson.

One forty-five minute lesson per week for one semester.....$27.00
Two half hour lessons per week for one semester 36.00
One hour ensemble lesson per week for one semester..... 27.00

When students enter late, lessons missed will be deducted at the rate of $1.00 per lesson.

Piano practice on the college pianos may be arranged for at the following rates:

One hour daily per semester.....$4.50
Additional hour per semester..... 3.50

PHYSICAL EDUCATION.

Directors, F. Bennion, Mrs. Una B. Herrick (Dean). Instructor, Eva McKinney. Medical Examiner, Dr. H. H. Judd.

Department For Men.

Director, F. Bennion. Medical Examiner, Dr. H. H. Judd.

This department is organized to provide for the physical betterment for all men students. While the work, at present, is chiefly confined to the development of intercollegiate athletics, inter-mural athletics and all forms of healthful recreative physical activity receive considerable attention and encouragement.

Students will not be permitted in intercollegiate competition without physical examination by the medical examiner and except under such conditions as are outlined by the faculty eligibility committee and the athletic council.

1. **Physical Education.** No credit. Mr. Bennion.
Athletics.
2. **Physical Education.** Yr.; 2 cr. Mr. Bennion.

Department For Women.

Director, Mrs. Una B. Herrick (Dean). Instructor, Eva McKinney. Medical Examiner, Dr. H. H. Judd.

The aim of the physical education department for women is to develop each woman to her highest economic value as a unit of society, to the end that when she finishes her college course she may carry forth into life a sane, well balanced, logical mind, high moral character, and a strong symmetrical properly functioning body, capable of assuming and performing cheerfully and well the duties of cultured womanhood.

Students who are relieved for any reason of the requirements in physical training, shall present four additional credits in some other subject; but the president may, at his discretion, excuse from such requirements any student in the employ of the institution.

1. **Physical Education.** Yr.; 2 cr. Miss McKinney.

Physical examination on entering. The chief aim throughout the year is to establish good posture and carriage and strengthen vital functions. The work will consist of Swedish body building work, some floor tactics, German rythmic dancing and games. Lect. 2.

2. **Physical Education.** Yr.; 2 cr. Miss McKinney.

The work for the second year women will consist of lectures and recreational games. Lect. 2.

Indoor and outdoor tennis courts and a volley ball court are furnished for the women, and beginning classes are organized; competitive games, including indoor baseball, are played between classes throughout the year.

All through the two years the course includes lectures on personal hygiene; general deportment for women; dress from the standpoint of health and appearance; the physiology of bodily exercise. The regulation gymnasium suit and shoes, which may be obtained from a local dealer, will be required.

SECRETARIAL STUDIES.

Professor, W. F. Brewer. Instructors, J. R. Libby, Theda Jones.

The secretarial course requires fifteen units of preparation and extends through four years. The technical work is planned to be directly applicable to business, and broad enough to serve as a basis for such positions as private secretary, office manager, etc.

The course includes a thorough grounding in English, and at least one modern language—French, German or Spanish, together with work in science, history, and social science. Women may elect some work in home economics. The technical work includes business procedure, office management and practice, business law, principles of accounting, principles underlying business activities, business statistics, shorthand and typewriting.

The degree Bachelor of Science is conferred upon students who have completed satisfactorily the prescribed four-year college course in secretarial work.

The two-year secretarial course is intended for those who cannot take the time to complete a four-year course. The completion of a high school course or its equivalent is required for entrance.

For Undergraduates.

1. **Shorthand.** Yr.; 8 cr. Miss Jones.

Fundamental principles of shorthand practice in word building, phrasing and dictation. Lect. 4.

2. Shorthand. Yr.; 6 cr. Miss Jones.

Practice in writing letters, legal papers, testimony, and miscellaneous matter. Students who take this course will also take secretarial 4. Lect. 3.

3. Typewriting. Yr.; 8 cr. Fee $1. Miss Jones.

Use and care of typewriters. Exercises for the development of proper wrist and finger movements, and for the mastery of the keyboard. Practice in letter writing and the use of carbon. Lect. 4.

4. Typewriting. Yr.; 6 cr. Fee $1. Miss Jones.

Practice in transcribing from shorthand notes and from manuscript. Dictation for the attainment of speed and accuracy; practice in the use of the mimeograph. Students who take this course will also take Secretarial 2. Lab. 3.

5. Business Procedure. II; 3 cr. Mr. Libby.

A study of business practices. The course includes a study of the forms and uses of the various instruments of credit and exchange; shipping documents; interest and discounts, commissions, cash and trade discounts, etc.; business correspondence. Lect. 3.

6. Office Practice. Yr.; 4 cr. Mr. Libby.

Practice with various kinds of office appliances and equipment, such as adding machines, addressing machines, filing, etc. Lect. 2.

7. Economics of Business. I; 3 cr. Mr. Libby.

This course offers a general survey of the principles underlying business activities. Lect. 3.

8. Commercial Law. II; 3 cr. Mr. Libby.

Students will be required to familiarize themselves with the rights and liabilites of parties to common business transactions, as contracts, sales, deeds, mortgages; and with the drawing up and the validity of commercial paper and contracts. Text and cases. Lect. 3.

9. Principles of Accounting. Yr.; 6 cr. Mr. Libby.

Principles underlying accounting in general. Laboratory exercises. Lect. 3.

11. Shorthand. Yr.; 4 cr. Miss Jones.

Advanced course, including special dictation practice for gaining speed. When possible, opportunity will be given to assist in the actual work of an office. Students who take this course will also take secretarial 12. Lect. 2.

12. Typewriting—Rapid Dictation. Yr.; 6 cr. Miss Jones.

Additional practice in transcribing from shorthand notes, also copying work for gaining speed on the machine. In addition to regular class work in courses 11 and 12, eighty hours of actual office practice will be required of each student, during the senior year. Students who take this course will also take secretarial 11. Lab. 3.

20. Business Statistics. Yr.; 4 cr. Mr. Libby.

Statistical principles and methods. Uses of statistics in business. Assigned problems. Lect. 2.

Courses For Vocational Teachers

To meet the growing need for teachers and leaders in the various fields of agricultural, industrial, and home economics education, the several courses for the training of vocational teachers will be organized, beginning with the academic year 1917-18. These courses will come within the Federal plan for vocational education under the provisions of the so-called Smith-Hughes Act of Congress passed in February 1917.

Courses for the preparation of high school teachers of trade, industrial and home economics subjects, high school teachers of agriculture, county agricultural agents and demonstrators will be offered. The work is so arranged in kind and quantity as to make it possible for students, who desire a general course in agriculture, manual arts and home economics, to obtain such a course and at the same time secure a preparation, which will enable them to qualify as teachers of these subjects and for extension work. Three separate courses, each providing four years instruction, have been provided for persons who desire to fit themselves for the work indicated above.

A present and growing need in Montana is for men who have had special training for county agent and demonstration work. The time is not far distant, when every county in the state will demand an agricultural specialist, one who will assist farmers in matters of organization, co-operation, pure bred stock, and a more scientific cultivation of the soil. Students who are preparing for this work will be given an opportunity to visit counties where agents are employed, take in extension schools, study the methods of the different extension specialists at the college, and under the direction of the department and State county agent leader prepare extension projects. In so far as possible, the student in his preparation will meet the problems which he will later meet in the field.

The special training begins with the junior year in each course. The freshman and sophomore years in the agricultural courses prepare for the junior year of the course in Agricultural Education and Extension Methods. The freshman and sophomore years in the applied science courses will be accepted when they include not less than sixteen credits of agriculture. The freshman and sophomore years in home economics prepare for the junior year of the Teachers' Course in Home Economics. The freshman and sophomore years in any of the engineering courses prepare for the junior year in the Teachers' Course in Trade and Industry. The freshman and sophomore years of other courses will be accepted if the following courses in mechanical engineering are included: mechanical drawing (M. E. 1), wood work (M. E. 2b), pattern work (M. E. 2a), foundry (M. E. 4).

COURSE IN AGRICULTURAL EDUCATION AND EXTENSION METHODS.

JUNIOR YEAR.

First Semester		Second Semester	
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Breeds of Live Stock (An. Husb. 2)	3	Breeds of Live Stock (An. Husb. 2a)	3
Poultry Management (Poult. 41)	4	Rural Life Problems (Ed. 4)	3
Psychology (Ed. 1a)	3	Development of Agricultural and Industrial Education (Ed. 1)	3
Wood Work (M. E. 2b)	2	Common Diseases (Vet. Sci. 57)	4
Soil Physics (Agron. 2)	5	Nutrition of Farm Animals (An. Husb. 4a)	3
	19		18

SENIOR YEAR.

Principles of Breeding (Agron. 7)	4	Farm Mechanics (Agron. 4)	3
Farm Records and Accounts (Agron. 10)	2	Secondary Agricultural Education (Ed. 2)	3
Office Practice (Sec. 6)	2	Teaching Practice (Ed. 3)	3
Beef Cattle and Sheep Production (An. Husb. 7)	3	Agricultural Cooperation and Extension (Ed. 5)	3
Farm Management (Agron. 6)	4	Sociology (Soc. 4)	3
Elective	4	Elective	4
	19		19

Note—Students preparing for county agent and extension work are not required to take Development of Agricultural and Industrial Education (Ed. 1), Secondary Agricultural Education (Ed. 2), and Practice Teaching (Ed. 3). They may elect other subjects with the approval of their adviser.

TEACHERS' COURSE IN HOME ECONOMICS.

JUNIOR YEAR.

First Semester		Second Semester	
Economics (Econ. 3)	2	Economics (Econ. 3)	2
Bacteriology (Bact. 12)	5	Costume Design (H. E. 15)	2
Textiles (H. E. 13)	2	Dress Design (H. E. 14)	3
Problems in Food Preparation (H. E. 4)	2	Physiological Chemistry (Chem. 11)	3
Household Physics (Phys. 9)	3	Textiles (H. E. 13)	2
Household Decoration (Art. 8b)	2	Household Management (H. E. 7)	3
Food Demonstration (H. E. 21)	2	Rural Life Problems (Ed. 4)	2
Elective	1	Elective	2
	19		19

SENIOR YEAR.

Psychology (Ed. 1a)	3	Sociology (Soc. 4)	3
History of Home Economics (H. E. 9)	2	Teaching Home Economics (H. E. 8)	4
Dietetics (H. E. 6)	4	Home Problems (H. E. 10)	3 to 5
Observation and Practice (H. E. 18)	2	Observation and Practice (H. E. 18)	2
Embroidery Design (Art 8a)	2	Sanitary Bacteriology (Bact. 13)	2
Art Needle Work (H. E. 16)	2	Elective	3
Elective	2 to 4		
	17 to 19		17 to 19

TEACHERS' COURSE IN TRADE AND INDUSTRY.

The details of this course are to be worked out and announced prior to the opening of the academic year, September, 1917.

Courses For Vocational Teachers

COURSES OF INSTRUCTION.

EDUCATION.

PROFESSORS, J. M. HAMILTON (President), M. J. ABBEY.
INSTRUCTORS, ...

The courses offered in this department are given by the specialists in vocational education and provide the theory and some practice for the students who are preparing to teach agriculture, home economics, and the industries in the secondary schools. Other subjects included in the teachers courses are to be found among the several departments.

All the equipment of the agricultural departments, including the farms, barns, live stock, and laboratories, the shops and engineering apparatus, and the kitchen laboratories, and sewing rooms of the home economics department are available.

So far as possible, opportunity will be given for observation and practice teaching. For this purpose the secondary schools in agriculture, home economics and mechanic arts at the college will be used. The Gallatin County High School offers some advantages.

For Undergraduates.

1a. Psychology. I; 3 cr. Mr. Hamilton.

General view of modern psychology, methods and materials of psychological investigation.

1. Development of Agricultural and Industrial Education. II; 3 cr. Mr.

The origin and development of industrial education in Europe and the United States. The influence of this movement upon contemporary education.

2. Secondary Agricultural Education. II; 3 cr. Mr.

For students preparing to teach agriculture in the high schools. Oranization of the class, equipment, laboratory instruction, field excursions, experimental plats, community work and agricultural clubs.

3. Teaching Practice. II; 3 cr. Mr.

The preparation of lesson plans and outlines with an opportunity to observe and teach classes in secondary agriculture. This is the practical part of the course in secondary agricultural education.

4. Rural Life Problems. II; 3 cr. Mr.

The fundamental problems of rural life, social, political, religious, and educational agencies and methods of correlation. As the basis of the course, a survey of a typical rural community will be made.

5. Agricultural Co-operation and Extension. II; 3 cr. Mr.

Practical preparation for county agent work and in modern methods of co-operative enterprise in agriculture.

Graduate Course For Nurses.

Repeated requests for a special advanced course for graduate nurses has resulted in the organization of a special course to be given at this institution during the first semester of each year.

The call for this advanced work is made by nurses of a progressive type who wish to attain greater general proficiency or fit themselves for some of the newer or more special lines in their profession such as school public health, or hospital work. The demand in these lines cannot be filled at the present time and most nurses in private practice are not fitted for them until they have pursued some special studies.

Most training schools, even those giving the best clinical experience, are unable to offer as much work as is profitable in certain lines of applied science, especially laboratory work. Furthermore some lines, such as bacteriology, sanitation and dietetics are developing so rapidly that it is quite difficult for those practicing their profession to keep abreast of the time.

This course is planned to supply these needs at a minimum of time and expense. It is made up of six lines of work namely; foods and dietetics, chemistry, bacteriology, physiology, and methods in public health and school nursing work. Laboratory work is given in the first four.

The course will be open only to graduate nurses, and a certificate will be awarded upon its completion.

For a description of the courses of instruction refer to the departments of Botany and Bacteriology, Chemistry, Entomology and Zoology, and Home Economics.

COURSE FOR GRADUATE NURSES.

Bacteriology and Sanitation (Bact. 15)	4
Inorganic and Organic Chemistry (Chem. 22)	4
Food Preparation (H. E. 22)	2
Dietetics (H. E. 23)	4
Physiology and Hygiene (Zool. 12)	4
School and Public Health Nursing (H. E. 24)	2
	20

Secondary Schools.

The department of secondary education is composed of the following schools: 1. School of Agriculture (Three-year Course); 2. School of Home Economics (Four-Year Course and Three-Year Course); 3. School of Mechanic Arts (Four-Year Course, Three-Year Course, and One-Year Course).

The first two years of the four-year courses in Home Economics and Mechanic Arts are discontinued.

School of Agriculture

The School of Agriculture offers practical instruction to the young men from the farms of Montana who wish to fit themselves for successful farming. The courses offered are intended as a preparation for life rather than for college. The student is brought into actual contact with the problems connected with the farm and learns that agriculture is a profession requiring both skill and knowledge.

Students in this school have the privilege of studying a modern dairy in operation, including types of the best breeds of dairy cattle; a complete poultry plant in operation, containing breeds illustrating especially the best laying strains and market fowls; modern grain and soil laboratories; model farm buildings and barns, with pure bred livestock; the experiment station farm; greenhouses and orchards; the large biological, chemical and physical laboratories, and the well-equipped wood and iron shops of the engineering department.

The variety of animals included upon the farm affords ample opportunity to see the various diseases, injuries, etc., encountered in farm animals. In the veterinary building there is provided a clinic room, where sick and injured animals are treated, and the student is given the benefits of these demonstrations.

The course extends through three years of six months each and comes in the winter season when the young men can be spared from farm work. For admission to this school, students must have passed the eighth grade or its equivalent, or give satisfactory evidence to the principal of the school that they are capable of carrying on the work. Young men twenty-one years of age or over will be admitted to the course without having completed the eighth grade provided they have had some practical experience on the farm and possess a fair common school education. Those who satisfactorily complete the course will be given diplomas.

COURSE IN THE SCHOOL OF AGRICULTURE.

FIRST YEAR

First Semester.		Second Semester	
English Exercises (Eng. f)	4	English Exercises (Eng. f)	4
Elementary Physics (Phys. b)	5	Animal Types (An. Husb. b)	2
Animal Types (An. Husb. a)	2	Mechanical Drawing (M. A. k)	2
Mechanical Drawing (M. A. k)	2	Parliamentary Law (Eng. i)	2
Carpentry (M. A. a)	2	Carpentry (M. A. a)	2
Military Science (Mil. Sci. a)	1	Military Science (Mil. Sci. b)	1
Elective	4	Elective	5 to 7
	20		18 to 20

SECOND YEAR

English Composition (Eng. g)	2	English Composition (Eng. g)	2
Plant Propagation and Tree Planting (Hort. a)	4	Elementary Chemistry (Chem. a)	5
Field Crops (Agron a)	4	Field Crops (Agron. b)	4
Farm Dairying (Dairy a)	3	Breed Types (An. Husb. d)	2
Breed Types (An. Husb. c)	2	Forge (M. A. b)	2
Common Diseases (Vet. Sci. k)	4	Soils (Agron. c)	4
Military Science (Mil. Sci. c)	1	Military Science (Mil. Sci. d)	1
	20		20

THIRD YEAR

Composition and Literature (Eng. h)	2	Composition and Literature (Eng. h)	2
Farm Management and Accounts (Agron. d)	4	Plant Diseases (Bot. c)	3
Feeding and Management (An. Husb. g)	3	Feeding and Management (An. Husb. h)	3
Animal Breeding (An. Husb. i)	3	Dairy Manufacture (Dairy b)	3
Agricultural Economics (Econ. a)	3	Farm Motors (M. A. s)	3
Forge (M. A. b)	2	Insect Pests (Ento. a)	3
Military Science (Mil. Sci. e)	1	Military Science (Mil. Sci. f)	1
Elective	2	Elective	2
	20		20

Electives: First year, first semester: Mathematics a, f. History d.

Electives: First year, second semester: Mathematics a, e. Horticulture b. Art b. History d. Agronomy e. Those who take Mathematics a or History d, the first semester of the first year will continue with the chosen subject the second semester.

Electives: Third year. Any subjects for which the student is eligible, subject to the advice and direction of the principal.

Note—Electives and options shall be selected subject to the approval of the principal.

School of Home Economics

The School of Home Economics is designed especially to fit young women to become home builders. The well equipped labortories, kitchens, sewing rooms, dairy, greenhouses, etc., are admirably fitted for making instruction intensely practical.

The entrance requirement for the three-year course is the completion of the eighth grade in the common schools or the equivalent. A diploma from the four-year course admits a student to the freshman class of the college. The young women who do not continue their studies have a practical training which fits them for home making, and which furnishes an excellent preliminary training for the vocations based upon domestic science and art.

The three-year course in this school extends through three years of six months each. Those who satisfactorily complete the course will be given diplomas.

The first two years of the four-year course are discontinued.

COURSE IN HOME ECONOMICS.

Note—The first two years of this course are discontinued.

THIRD YEAR

First Semester.		Second Semester	
American Literature (Eng.c)	4	American Literature (Eng. c)	4
Elementary Physics (Phys. a)	4	Elementary Physics (Phys. a)	4
Dressmaking (H. E. b)	2	Dressmaking (H. E. b)	4
Household Decoration (H. E. m)	2	Household Sanitation (H. E. k)	2
Household Sanitation (H. E. k)	2	Elective	4
Elective	4	Physical Education (Phys. Ed. c)	1
Physical Education (Phys. Ed. c)	1		
	19		19

FOURTH YEAR

English Literature (Eng. d)	4	English Literature (Eng. d)	4
German (German b)	4	German (German b)	4
Foods (H. E. h)	2	Foods (H. E. h)	2
Algebra (Math. b)	4	Solid Geometry (Math. d)	4
Elective	3 or 4	Elective	3 or 4
Physical Education (Phys. Ed. d)	1	Physical Education (Phys. Ed. d)	1
	17 or 18		17 or 18

Electives: Mathematics 2a; Art 10, 13; Home Economics d, 14; Dairy c.

COURSE IN THE SCHOOL OF HOME ECONOMICS.

FIRST YEAR

First Semester.		Second Semester	
English Exercises (Eng. f)	4	English Exercises (Eng. f)	4
Textiles (H. E. c)	2	Garment Making (H. E. a)	4
Garment Making (H. E. a)	2	Drawing (Art a)	2
Drawing (Art a)	2	Parliamentary Law (Eng. i)	2
Cooking (H. E. g)	4	Cooking (H. E. g)	4
Industrial Arithmetic (Math. f)	4	Home Gardening (Hort. d)	3
Physical Education (Phys. Ed. a)	1	Physical Education (Phys. Ed. a)	1
	19		20

SECOND YEAR

English Composition (Eng. g)	2	English Composition (Eng. g)	2
Cooking (H. E. e)	4	Cooking (H. E. e)	4
Dressmaking (H. E. b1)	3	Dressmaking (H. E. b1)	4
Household Sanitation (H. E. k1)	3	General History (Hist. d)	4
General History (Hist. d)	4	Chemistry (Chem. a)	5
Elective	3 or 4	Physical Education (Phys. Ed. b)	1
Physical Education (Phys. Ed. b)	1		
	19 or 20		20

THIRD YEAR

Composition and Literature (Eng. h)	2	Composition and Literature (Eng. h)	2
House Planning and Decoration (H. E. m1)	3	Home Dairying (Dairy c)	3
Home Nursing (H. E. 1)	2	Household Management (H. E. j)	4
Foods (H. E. h1)	2	Foods (H. E. h1)	2
Dressmaking (H. E. d)	2	Dressmaking (H. E. d)	2
Elective	7 or 8	Elective	5 or 6
Physical Education (Phys. Ed. c)	1	Physical Education (Phys. Ed. c)	1
	19 or 20		19 or 20

Electives: Second year, first semester: Poultry e. Music, or other subjects for which the student is eligible.

Electives: Second year, second semester: Art, Music, or other subjects for which the student is eligible.

Electives: Third year, first semester: Art 11, 12, 13, 14. Horticulture c. Music, or other subjects for which the student is eligible.

Electives: Third year, second semester: Art 11, 12, 13, 14. Botany c. Music or other subjects for which the student is eligible.

School of Mechanic Arts.

The School of Mechanic Arts is designed principally for those who wish to do their own mechanical work on the farm, to prepare themselves to become shop foremen, electricians, section bosses, engine men, firemen, contractors, traction engine men, draftsmen, etc.

For admission to the three courses in this school, namely, four-year course, three-year course, and traction and stationary engine course, the equivalent of an eighth grade certificate is required. The first two years of the four-year course are discontinued.

The large well-equipped science laboratories, drawing rooms, and shops provide facilities for work that will rank with the best secondary polytechnic schools. The instruction is given by the regular faculty members in their subjects. Those who complete the four-year course in mechanic arts are eligible to enter the freshman class of the college. To those who satisfactorily complete either the three-year or four-year courses diplomas will be given.

The traction and stationary engine course is introduced for the benefit of those who wish to prepare themselves for the operation of gas and steam machinery.

COURSE IN MECHANIC ARTS.

Note—The first two years of this course are discontinued.

THIRD YEAR

First Semester.		Second Semester	
American Literature (Eng. c)	4	American Literature (Eng. c)	4
Physics (Phys. a)	4	Physics (Phys. a)	4
German (German b)	4	German (German b)	4
Mechanical Drawing (M. A. n)	2	Mechanical Drawing (M. A. n)	2
Foundry (M. A. d)	2	Machine Work (M. A. f)	4
Machine Work (M. A. f)	2	Military Science (Mil. Sci. f)	1
Military Science (Mil. Sci. e)	1		
	19		19

FOURTH YEAR

English Literature (Eng. d)	4	English Literature (Eng. d)	4
Algebra (Math b)	4	Solid Geometry (Math. d)	4
Mechanical Design (M. A. o)	4	Mechanical Design (M. A. o)	4
Machine Work (M. A. h)	2	Machine Work (M. A. h)	2
Steam Boilers and Practice (M. A. p) or Electrical Practice (M. A. t)	3 or 4	Steam and Gas Engines (M. A. r) or Electrical Practice (M. A. t)	3 or 4
Military Science (Mil. Sci. g)	1	Military Science (Mil. Sci. h)	1
	18 or 19		18 or 19

COURSE IN THE SCHOOL OF MECHANIC ARTS.

FIRST YEAR

First Semester.		Second Semester	
English Exercises (Eng. f)	4	English Exercises (Eng. f)	4
Algebra (Math. a)	4	Algebra (Math. a)	4
Mechanical Drawing (M. A. 1)	2	Mechanical Drawing (M. A. 1)	2
Forge (M. A. b)	2	Forge (M. A. b)	2
Carpentry (M. A. a)	2	Carpentry (M. A. a)	2
Pattern Making (M. A. e)	2	Pattern Making (M. A. e)	2
Elective	2	Foundry (M. A. d)	2
Military Science (Mil. Sci. a)	1	Military Science (Mil. Sci. b)	1
	19		19

SECOND YEAR

English Composition (Eng. g)	2	English Composition (Eng. g)	2
Shop Arithmetic (Math. e)	4	Shop Arithmetic (Math. e)	4
Elementary Physics (Phys. c)	4	Elementary Physics (Phys. c)	4
Mechanical Drawing (M. A. m)	2	Mechanical Drawing (M. A. m)	2
Elective	6 or 7	Elective	6 or 7
Military Science (Mil. Sci. c)	1	Military Science (Mil. Sci. d)	1
	19 or 20		19 or 20

THIRD YEAR

Composition and Literature (Eng. h)	2	Composition and Literature (Eng. h)	2
Geometry (Math. c)	4	Geometry (Math. c)	4
Elective	12 or 13	Elective	12 or 13
Military Science (Mil. Sci. e)	1	Military Science (Mil. Sci. f)	1
	19 or 20		19 or 20

Electives: Mechanic Arts, a1, b1, d1, e, g, h, hl, n, o, q, t, u, v, w, y; History d.
Elective: Third year, Mechanic Arts j.

TRACTION AND STATIONARY ENGINE COURSE

First Semester		Second Semester	
Mechanical Drawing (M. A. 1)	2	Mechanical Drawing (M. A. 1)	2
Steam Boilers and Practice (M. A. q)	5	Steam Boilers and Practice (M. A. q)	5
Machine Work (M. A. g)	2	Machine Work (M. A. g)	2
Gas Engines and Gas Tractors (M. A. u)	2	Gas Engines and Gas Tractors (M. A. u)	2
Electrical Practice (M. A. t)	3	Electrical Practice (M. A. t)	3
Elective	7 or 8	Elective	7 or 8
Military Science (Mil. Sci. a)	1	Military Science (Mil. Sci. b)	1
	22 or 23		22 or 23

Electives: Mechanic Arts a, b, d, e, j, m, v, w. If it is found necessary, the size of the elective classes will be limited. The course in Automobile Repair and Operation (M. A. j) will be limited in the number of students admitted to the class.

Secondary School

COURSES OF INSTRUCTION.

Note—The Roman numerals I and II designate the semester in which the course is given. When the course is continuous through the year, the abbreviation, "Yr." is used.

AGRONOMY.

Professor, A. Atkinson. Assistant Professors, W. O. Whitcomb, E. L. Currier, H. E. Murdock.

a. Field Crops. I; 4 cr. Mr. Whitcomb.

Methods of growing and producing oats, wheat, flax, rye, and corn. Lect. 3; lab. 1.

b. Field Crops. II; 4 cr. Prerequisite Agronomy a. Mr. Whitcomb.

Forage crops, and grasses. Lect. 3; lab. 1.

c. Soils. II; 4 cr. Mr. Whitcomb.

Formation and classification of soils, including a study of tillage and the methods for keeping up the soil's productiveness. Lect. 4.

d. Farm Management and Accounts. II; 4 cr. Mr. Currier.

Practical methods of managing a farm. Lect. 3; lab. 1.

e. Farm Machinery. II; 3 cr. Prerequisite Physics b. Mr. Murdock.

Study of the various types of farm machinery. Selection, adjustment and care of farm machinery. Modern farm conveniences, such as telephones, water supply systems, etc. Lect. 2; lab. 1.

f. Irrigation and Drainage. I; 2 cr. Prerequisite Physics b. Mr. Murdock.

Methods of irrigating and draining land. Lect. 1; lab. 1.

ANIMAL INDUSTRY.

Professor, C. N. Arnett, Assistant Professor, R. C. McChord. Instructor, O. Tretsven.

a. Animal Types. I; 2 cr. Fee $1. Mr. McChord, Mr. Tretsven.

Market types of cattle and sheep. Lab. 2.

b. Animal Types. II; 2 cr. Fee $1. Mr. McChord, Mr. Tretsven.

Judging of the market types of dairy cattle, horses, and swine. Lab. 2.

c. Breed Types. I; 2 cr. Fee $1. Prerequisites Animal Husbandry a, b. Mr. Tretsven.

Breed types of cattle and sheep. Lect. 1; lab. 1.

d. Breed Types. II; 2 cr. Prerequisites Animal Husbandry a, b. Mr. Tretsven.

Breed types of dairy cattle, horses, and swine. Lab. 1.

g. Feeding and Management of Livestock. I; 3 cr. Prerequisites Animal Husbandry c, d. Fee $2. Mr. Tretsven.

Methods of feeding and managing cattle and sheep. Methods by which animals are prepared for the show ring. Lect. 2; lab. 1.

h. Feeding and Management of Live Stock. II; 3 cr. Prerequisites Animal Husbandry c, d. Fee $2. Mr. Tretsven.

Methods of feeding, showing and managing horses and hogs. Lect. 2; lab. 1.

i. Animal Breeding. I; 3 cr. Prerequisites Animal Husbandry c, d. Mr. McChord.

Principles of breeding as directly applied to the farm. Cross breeding, inbreeding, and line breeding. Lect. 2; lab. 1.

ART.

Assistant Professor, Lana Baldwin. Instructor, Muriel Moore.

a. Drawing. Yr.; 4 cr. Fee $.50. Miss Moore.

Freehand drawing from geometric solids and casts. Study of light and shade. Object drawing, in charcoal, pencil pen, and ink. Study of linear perspective with practical exercises in perspective sketching. Lab. 2.

b. Drawing. Yr.; 4 cr. Fee $.50. Miss Moore.

Continuation of Course a, with study of design and handicraft. Lab. 2.

BOTANY AND BACTERIOLOGY.

Professor, D. B. Swingle. Assistant Professors, H. M. Jennison, H. B. Foote.

c. Plant Diseases. II; 3 cr. Fee $1. Mr. Jennison.

A study of the importance, symptoms, and methods of control of the more important diseases of plants. Lect. 2; lab. 1.

CHEMISTRY.

Professor, W. M. Cobleigh. Assistant Professor, R. H. Bogue.

a. Elementary Chemistry. II; 5 cr. Mr. Bogue.

Lectures with experimental illustrations, and recitations on general elementary chemistry. Special emphasis will be given to the applications of the science to daily life, and to agriculture. Lect. 5.

DAIRY HUSBANDRY.

PROFESSOR, G. L. MARTIN.

a. **Farm Dairying.** I; 3 cr. Fee $2; Deposit $.50.

Dairy problems as applied to building up the dairy herd, care and management of the herd, and marketing dairy products. Applications of the Babcock test, and operation of hand separators. Lect. 2; lab. 1.

b. **Dairy Manufacture.** II; 3 cr. Fee $1; Deposit $.50.

Farm and factory methods of making butter, cheese and frozen products and preparing them for markets. Lect. 2; lab. 1.

c. **Home Dairying.** II; 3 cr. Fee $1; Deposit $.50.

Composition, properties and uses of milk and its products; care and handling, fermentations, adulterations, modification, ripening of cream for butter making. Manipulation of tests, manufacture of butter, cheese and frozen products. Lect. 2; lab. 1.

ECONOMICS AND SOCIOLOGY.

PROFESSOR, J. M. HAMILTON (President). INSTRUCTOR, ...

a. **Agricultural Economics.** I; 3 cr. Mr.

A study of such agricultural economic problems as the value and rent of land, farm labor, rural credit, cooperative buying and selling. Lect. 3.

b. **Rural Sociology.** II; 3 cr. Mr.

The social problems of the open country, rural health and sanitation, the country church, the rural school, means of communication and transportation, libraries and recreations. Lect. 3.

ENTOMOLOGY AND ZOOLOGY.

PROFESSOR, R. A. COOLEY. ASSISTANT PROFESSOR, M. H. SPAULDING.

a. **Insect Pests.** II; 3 cr. Mr. Cooley.

Lectures on the more important insect pests of Montana and the means of their control. Lect. 3.

ENGLISH.

PROFESSOR, W. F. BREWER. ASSISTANT PROFESSOR, J. H. HOLST. INSTRUCTOR, MIGNON QUAW. MR. POWELL.

c. **American Literature.** Yr.; 8 cr. Miss Quaw.

Reading of American authors; history of the literature, character of the different periods, and the connection between the literature and other aspects of American history. Considerable amount of written work Lect. 4.

d. English Literature. Yr.; 8 cr. Miss Quaw.

English authors from the Elizabethan period to the present day, with the greater amount of the time devoted to the more recent authors. History of the people and literary chronology; emphasis will be placed on learning how to read books of established worth. Written work. Lect. 4.

f. English Exercises. Yr.; 8 cr. Mr. Holst, Mr. Powell.

Practice in spelling, punctuation, note taking, letter writing, and the simpler forms of composition. Lect. 4.

g. English Composition. Yr.; 4 cr. Mr. Holst.

Paragraph and its development, sentence structure and words. Practice in oral and written composition. Masterpieces are read as a basis for a careful study of good style. Lect. 4.

h. Composition and Literature. Yr.; 4 cr. Mr. Holst.

Forms of literature. Study and writing of narration, description, exposition, and argumentation. At least one good example of each of the four forms of composition is studied in class. Lect. 4.

i. Parliamentary Law. II; 2 cr. Mr. Holst.

The principles of parliamentary law, the conduct of meetings, the organization of a society, the duties of officers, the recording of proceedings. The students will be given drill and actual practice. Lect. 2.

GERMAN.

Assistant Professor, Carrie Cehrs.

b. Second Year German. Yr.; 8 cr.

Texts suitable for second year work; for the most part, the writing of contemporary authors. Memorizing of easy colloquial sentences and poems. Conversation and composition. Lect. 4.

HISTORY.

Assistant Professor, Helen R. Brewer.

d. General History. Yr.; 8 cr.

A course in modern history. Lect. 4.

HOME ECONOMICS.

Professor, Lilla Harkins. Assistant Professors, Florence Balinger, Carlotta Ford. Instructor, Amy Rolfe.

a. Garment Making. I; 2 cr. II; 4 cr. Fee $1. Miss Rolfe.

Fundamental principles of hand and machine sewing applied to the making of aprons and undergarments. Students provide suitable materials. The finished work is the property of the student. Lab. 2 or 4.

b. Dressmaking. I; 2 cr. II; 4 cr. Fee $1. Miss Ballinger.

Designing, cutting and making simple dresses.

b1. Dressmaking. I; 3 cr. II; 4 cr. Fee $.50. Miss Ballinger.

Same as course b.

c. Textiles. I; 2 cr. Fee $1.50. Miss Rolfe.

Study of cotton, wool, silk, and linen, in regard to its microscopical structure, physical properties, manner of growth, and manufacture into cloth. Simple tests for adulteration. Lect. 1; lab. 1.

d. Dressmaking. Yr.; 4 cr. Fee $.50. Miss Ballinger.

More advanced work than b1.

e. Cooking. Yr.; 4 cr. Fee $2. Miss Harkins.

Same as Course g. Lect. 1; leb. 2.

g. Cooking. Yr.; 8 cr. Fee $3. Miss Harkins.

Plain cooking, such as bread, meats, eggs, cereals, soups, salads, preserving fruits, cakes, candy and simple dessert. Visits to the meat market to study cuts of meat. Students are shown how biology and chemistry apply to the preparation of foods. Lect. 2; lab. 2.

h. Foods. Yr.; 4 cr. Fee $2.50. Miss Ford.

General principles of human nutrition. Some attention is given to invalid cookery. Lab. 2.

h1. Foods. Yr.; 4 cr. Fee $1.50. Miss Ford.

Same as Course h. Lab. 2.

j. Household Management. II; 4 cr. Fee $.50. Miss Rolfe.

Expenditure of income, furnishing with reference to economy and efficiency, also the working out of a number of home problems by each member of the class. Lect. 3; lab. 1.

k. Household Sanitation. Yr.; 4 cr. Miss Rolfe.

Care of the home from a sanitary standpoint. Source of water supply, and preservation of food. Lect. 3; lab. 1.

k1. Household Sanitation. I; 2 cr. Miss Rolfe.

Same as Course k. Lect. 1; lab. 1.

l. Home Nursing. I; 2 cr. Miss Ford.

Care of sick room, making beds, bathing, bandaging, emergencies, etc. Lect. 1; lab. 1.

m. Household Decoration. I; 2 cr. Miss Rolfe.

Location of the house, house plans, finishing and furnishing of the home. Lect. 1; lab. 1.

m1. House Planning and Decoration. I; 3 cr. Miss Rolfe.

Same as Course m. Lect. 1; lab. 2.

HORTICULTURE.

Professor, O. B. Whipple. Assistant Professor, C. C. Starring.

a. Plant Propagation and Tree Planting. I; 4 cr. Fee $1. Mr. Starring.

Plant propagation with special reference to the methods of multiplying fruit and planting of trees. The latter part of the course deals with simple principles of ornamental planting and ornamental plants, and the growing of trees adapted to Montana conditions. Lect. 4.

b. Vegetable Gardening and Small Fruit Culture. II; 3 cr. Mr. Starring.

Methods of growing, gathering, storing, and marketing the more important vegetable crops; hot bed construction and management; and the growing of such small fruits as the strawberry, raspberry, blackberry, currants, and gooseberry. Lect. 3.

c. Fruit Growing. I; 3 cr. Prerequisite Horticulture a. Mr. Starring.

Selecting sites, planning and planting, cultivation, irrigation, pruning, and general care of the orchard, more especially from the standpoint of the home orchard. Lect. 3.

d. Home Gardening. II; 3 cr. Mr. Starring.

Elementary course dealing with the principles of plant propagation, vegetable gardening, small fruit culture, and ornamental gardening. Lect. 3.

MATHEMATICS.

PROFESSORS, W. D. TALLMAN, J. H. HOLST. INSTRUCTOR, FRIEDA BULL.

a. Algebra. Yr.; 8 cr. Miss Bull. Lect. 4.

b. Advanced Algebra. I; 4 cr. Miss Bull.

Simultaneous quadratic equations, graphical representations of simple equations in two variables; theory of indices, (positive, negative, fractional, zero), radicals, etc. Lect. 4.

c. Plane Geometry. Yr.; 8 cr. Prerequisite Mathematics a. Miss Bull.

This includes in addition to the work given in the standard texts, a large number of original exercises. Lect. 4.

d. Solid Geometry. II; 4 cr. Prerequisites Mathematics b, c. Miss Bull.

Geometry of the sphere. Lect. 4.

e. Shop Arithmetic. Yr.; 8 cr. Miss Bull.

Designed to develop skill and accuracy in the fundamental processes of arithmetic. Problems will be chosen very largely of the type the student will actually encounter in connection with his mechanical work. Lect. 4.

f. Industrial Arithmetic. I; 4 cr. Mr. Holst.

Fundamental processes of arithmetic related to the work of farm experience. Mathematical problems connected with the work of the shop and laboratory. Lect. 4.

MECHANIC ARTS.

PROFESSOR, A. W. RICHTER (Dean). ASSISTANT PROFESSORS, R. T. CHALLENDER, F. C. SNOW. INSTRUCTORS, F. W. KATELY, R. D. SLOAN, F. C. MILLER, F. HOMANN. MR. PARK.

a. Carpentry. Yr.; 4 cr. Fee $3. Mr. Challender.

Use and care of carpentry tools. Series of exercises in joinery, followed by practice in framing and rafter and stair cutting. Lab. 2.

a1. Carpentry. Yr.; 2 to 12 cr. Deposit $4. Mr. Challender.

Continuation of Course (a) for those who wish to continue the work in carpentry. Lab. 1 to 6.

b. Forge. Yr.; 4 cr. Fee $4. Mr. Kately.

Care and manipulation of fire, iron forging, including the operation of drawing, upsetting, pointing, bending, welding, calculation, of stock; implement repairs, plow pointing, manufacture of chains, hooks, clevises, etc.. Lab. 2.

b1. Forge. Yr.; 2 to 12 cr. Deposit $4. Mr. Kately.

Continuation of Course (b) for those who wish to continue the work in forge. Lab. 1 to 6.

d. Foundry. I; 2 cr. Fee $1. Mr. Kately.

Bench and floor molding in green sand. Casting in white metal, brass, and cast iron are poured for use in the machine shop. Lab. 2.

d1. Foundry. Yr.; 2 to 12 cr. Deposit $4. Mr. Kately.

Continuation of Course d for those who wish to continue the work in foundry. Lab. 1 to 6.

e. Pattern Making. Yr.; 4 cr. Fee $1. Mr. Challender.

Allowances on pattern for draft, shrinkage and finish; construction of patterns for pulleys, hangers, machine parts and pipe fittings, with the necessary core boxes. Lab. 2.

f. Machine Work. I; 2 cr. II; 4 cr. Mr. Homann.

Bench work, including chipping, filing, scraping, fitting; machine tool work on drill press, shaper, planer, and lathe. Lab. 2 and 4.

g. Machine Work. Yr.; 4 cr. Fee $2. Mr. Homann.

Chipping and filing. Bench work in iron. Lab. 2.

h. Machine Work. Yr.; 4 cr. Fee $2. Mr. Homann.

Work on lathe, milling machine and grinder, with practice in hardening and tempering taps, dies, cutters and high speed steels. Lab. 2.

h1. Machine Work. Yr.; 2 to 12 cr. Deposit $4. Mr. Homann.

General shop work, continuation of Course (h) for those who wish to continue the work in the machine shop. Lab. 1 to 6.

j. Automobile Repair and Operation. 2 cr. Fee $2. Mr. Homann.

Construction and repair of the automobile. Laboratory and lectures. Lect. 1; lab. 1.

k. Mechanical Drawing. Yr.; 4 cr. Mr. Miller.

Elements of lettering; geometrical constructions, isometric and orthographic representations, working drawings. Farm building construction, bills of material. Details of forms for concrete work, silo construction, plumbing and sanitation. Farm maps. Lab. 2.

1. Mechanical Drawing. Yr.; 4 cr. Mr. Miller.

Lettering. Geometrical construction, freehand sketching of simple machine parts, reproduced in detailed working drawings; orthographic projection. Lab. 2.

m. Mechanical Drawing. Yr.; 4 cr. Mr. Miller.

Machine and architectural detail drawing, tracing and blue-printing; isometric and cabinet projection; intersections and development of surfaces with applications in roof framing and sheet-metal work. Lab. 2.

n. Mechanical Drawing. Yr.; 4 cr. Mr. Miller.

Machine drawing and the elementary principles of mechanism: screws, threads, screws and bolts; pulleys and belting, gear tooth, curves, gears in train, change gears. Lab. 2.

o. Mechanical Design. Yr.; 8 cr. Mr. Miller.

Machine drawing and elementary design. Bearings and journals, differentials, and change speed mechanism, gearing, engine parts, quick returns, punches, shears, presses. Lab. 4.

p. Steam Boilers and Practice. I; 4 cr. Prerequisites Physics a, Mechanic Arts k, l, f. Mr. Park.

Construction and operation of steam boilers, and their auxiliaries, physical properties of steam, combustion of fuel, pumps, injectors, feed water heaters, condensers. Lect. 2; lab. 2.

q. Steam Boilers and Practice. Yr.; 10 cr. Fee $1. Mr. Richter, Mr. Challender, Mr. Park.

Three hours recitation and two periods practice per week. Lect. 3; lab. 2.

r. Steam and Gasoline Engines. II; 4 cr. Prerequisite Mechanic Arts a. Fee $2. Mr. Homann.

Construction and operation of steam and gasoline engines and tractors, valves and valve gears, governors; lubricators; indicator cards, indicated horsepower, brake horse power, efficiency. Lect. 2; lab. 2.

s. Farm Motors. II; 3 cr. Fee $2. Mr. Park.

Motors adapted to use on the farm, particularly the gas engine, with practice in operating and locating troubles. Tractor practice and study of simple stationary installations. Lect. 1; lab. 2.

t. Electrical Practice. Yr.; 6 cr. Prerequisite Physics c. Fee $1. Mr. Sloan.

Elementary principles of electricity, electric wiring, management and care of electrical machines and apparatus, including dynamos and motors, batteries, electric lights, telephones and telegraph apparatus. Lect. 2; lab. 1.

u. Gas Engines and Gas Tractors. Yr.; 4 cr. Fee $2. Mr. Homann.

Operation, construction and repair of gasoline engines and gas tractors. Lect. 1; lab. 1.

v. Leveling. Yr.; 4 cr. Mr. Snow.

Determination of slopes and distances. Measurement of plane areas. Lect. 1; lab. 1.

w. Pipe Fitting and Plumbing. I or II; 2 cr. Fee $2. Mr. Park.

Fitting of steam and gas pipe, exercises in plumbing; wiping joints. Lab. 2.

y. Water Measurement. I or II; 2 cr. Mr. Snow.

Measurement of water by means of weirs and current meters. Hydraulic rams. Small water power installations. Lect. 1; lab. 1.

MILITARY SCIENCE.

PROFESSOR, CAPTAIN H. C. CLARK. INSTRUCTOR, SERGEANT, F. BLOSS.

a. Military Science. I; 1 cr.

Refer to military science courses in the college for a description of this work and the courses that follow.

b. Military Science. II; 1 cr.

c. Military Science. I ; 1 cr.

d. Military Science. II; 1 cr.

e. Military Science. I; 1 cr.

f. Military Science. II; 1 cr.

g. Military Science. I; 1 cr.

h. Military Science. II; 1 cr.

PHYSICS.

PROFESSOR, F. W. HAM. INSTRUCTOR, J. A. KIEFER.

a. Elementary Physics. Yr.; 8 cr. Fee $1. Deposit $1. Mr. Kiefer.

Lectures with experimental illustrations, recitations, assigned problems, and laboratory work in mechanics, sound, heat, light, electricity and magnetism. Lect. 3; lab. 1.

b. Elementary Physics. I; 5 cr. Mr. Kiefer.

Experimental lectures, recitations, and assigned problems on mechanics, heat, light, and electricity. Emphasis will be placed upon those subjects that have a direct bearing on applied agriculture. Lect. 5.

c. Elementary Physics. Yr.; 8 cr. Mr. Kiefer.

Demonstration lectures, assigned problems, and recitations in mechanics, heat, electricity and magnetism, light and sound. Lect. 3; lab. 1.

PHYSICAL EDUCATION.

MRS. UNA B. HERRICK (Dean). INSTRUCTOR, EVA MCKINNEY.

a. Physical Education. Yr.; 2 cr.

Physical examination on entering. The chief aim throughout the year is to establish good posture and carriage and strengthen vital functions. The work will consist of Swedish body building work, some floor tactics, German rythmic dancing and games. Class exercises 2.

b. Physical Education. Yr.; 2 cr.

Athletics. Tennis, volley ball, basketball, indoor baseball, and recreational games. Lectures and exercises.

c. Physical Education. Yr. 2 cr.

Folk Dancing. Recreational games. Class Exercises 2.

d. Physical Education. Yr.; 2 cr.

Continuation of course c. Class exercises 2.

POULTRY.

PROFESSOR, W. F. SCHOPPE.

e. Farm Poultry. I; 3 cr.

Various breeds and their adaptability to farm use. Housing, feeding, incubator and brooding. Judging birds, operating incubators and brooders. Lect. 1; lab. 2.

VETERINARY SCIENCE.

PROFESSOR, H. WELCH.

k. Common Diseases. I; 4 cr.

Physiology of the digestive, respiratory and blood vascular systems, in connection with a study of the common diseases. Wounds and their treatment, general conformation and care of the teeth and some of the more common ailments in all species of domestic animals. Care and handling of breeding animals and accidents and diseases attendent upon parturition. Lect. 4.

Summer Session

The courses of the Summer Session are designed primarily to meet the needs of the rural teachers of Montana who are interested in making the school serve the community in a very definite way. Courses will be given in agricultural and industrial subjects, but constructive planning for rural betterment through the agency of the country school, will be particularly emphasized.

We must look to the rural schools for something more than the general diffusion of agricultural knowledge. It is the duty of the Agricultural College not only to prepare teachers to meet examination requirements in agriculture, but also to give the broader outlook which will enable them to apply their knowledge to the improvement of country life conditions, through a due consideration of economic and social relations.

Agriculture Must Be Taught in the Public Schools.

The legislature this year passed a law requiring the teaching of agriculture in the public schools. The Agricultural College Summer Session will have the faculty and the equipment to prepare teachers to meet the requirements of the new law

Professional Preparation Required.

The following law was approved by the Governor on March 3, 1917; "After July first, 1920, no person shall be given a regular certificate to teach, who has not had at least twelve weeks of normal training work." This requirement can be met by attendance at two Summer Sessions at the Agricultural College.

County Summer Schools Unite.

Miss Ida Davis, county superintendent of Gallatin county, has designated the College Summer Session as her county summer school. Other county superintendents may legally designate the College as the place for their joint county summer school with Gallatin County and will be very welcome to do so. From early correspondence it seems likely that a number of other counties will unite upon the College Summer Session, some even from remote parts of the state.

The college will provide the faculty and the equipment, and will refund railway fare according to the rule given in a later paragraph.

Courses Offered.

The following courses will be offered: Elementary agriculture, cooking, sewing, handicraft, rural school organization and methods, rural problems, nature study, elementary physics and chemistry, botany and Montana flora, rural arithmetic, hygiene and sanitation, manual training, Montana history, Montana civics, Montana geography, school law, public school music, and community singing, public school drawing, rural primary methods, elementary psychology, dairying, school and home gardening, soils, crops, and the common branches. Courses not required for certificate credit will be given on the request of eight or more students.

Courses Required for Certificate Credit.

Teachers who desire certificate credit (see paragraph below) are required to take at least two of the following subjects; agriculture, cooking, sewing, manual training, rural arithmetic, nature study, rural school organization and methods.

Admission.

The courses of the Summer Session are open to all persons who are qualified to pursue them to advantage.

Certificate and Credit.

Certificates of attendance and of courses satisfactorily completed will be issued to all who attend. Those who complete satisfactorily courses offered by the college corresponding to those required by state law for a teacher's certificate, will be entitled to certificate credit. The work in these subjects is to be equal in amount to that required by the State Normal College in the corresponding subjects.

EXPENSES.

Registration.

A registration fee of $10 is required of all students taking two or more subjects. A registration fee of $5 is required of those taking only one subject. No refund of railway fare will be made to those taking only one subject.

Laboratory Fees.

In addition to the registration fee, fees to cover breakage and material furnished to students will be required in certain vocational and laboratory subjects as follows:

Cooking	$3.00
Sewing	1.00
Public School Drawing	1.00
Handicrafts	3.00
Manual Training	1.50
Soils	1.00
Crops	1.00
Primary Methods	1.00
Chemistry	1.50
Dairy	2.00

Board and Room.

Board and room for women at Hamilton Hall will cost $40.00 for the session or $6.75 a week in advance in both cases. Men may be accommodated for board only at $30.00 for the session, or $5 a week. Board and room in private families will cost about $25.00 to $30.00 a month.

Hamilton Hall will be ready for occupancy June 10th.

Refund of Railway Fare.

The University desires to make the opportunities for study afforded in the Summer Session equally accessible to all Montana teachers and students. Therefore, each regularly enrolled student who carries satisfactorily at least four hours of regular work for at least four weeks during the Summer Session will be entitled to receive, at the close of the session, a refund of the amount paid for the round trip railroad fare less $5.00 The amount of the refund will be based upon the cheapest route at the one and one-third round trip rate. This refund can not be made to teachers or students who purchase tickets from points outside the state, or to anyone who has not secured the proper railway receipts.

OTHER INFORMATION.

The Round Table.

The round table discussions which have been an interesting feature of the agricultural college Summer Sessions will be continued. At least three hours each week will be provided for the round table. Rural problems of general interest will be considered under the direction of capable leaders selected from the faculty and students.

The Conference Hour.

The faculty of the Summer Session will be in intimate touch with rural problems. Several of the faculty are prominent leaders in rural school work, and they will appoint one hour each day for individual conferences. Experience has shown that many teachers welcome such an opportunity for direct personal assistance in matters which may not be of general interest or which they may feel some timidity in bringing to the round table.

General Assembly.

A general assembly will be held for twenty minutes each morning. This time will be given to announcements and to singing under the direction of the leader in community singing. A general assembly will also be held at 11 o'clock on Friday of each week at which time visiting lecturers will be heard.

Teacher's Appointment Committee.

The Summer Session will maintain an appointment committee to assist teachers to secure positions. The services of the committee are free to students and school officers. Last year more than fifty vacancies were reported to the director of the Summer Session.

Library.

The college library will be open throughout the Summer Session and an extensive classified list of bulletins, conveniently arranged, will be available for reading and reference. The attention of the rural teacher will be called to the vast amount of valuable information in bulletin form for free distribution, and directions and plans for its use will be given.

Recreation.

Students will have the use of the college tennis courts and gymnasium. Outdoor games in which all are invited to take part will be encouraged and competent direction will be provided.

Week-end excursions will be made to Bridger Canyon and the United States fish hatchery, to a highly developed rural community with its school and church, industrial and social organizations, and to other places of interest.

The mountains, canyons and trout streams near Bozeman invite to wholesome recreation during the recesses from work.

Excursions Through Yellowstone Park.

At the close of the session the fourth annual excursion through the Yellowstone National Park will be made, July 21-28. From thirty to fifty teachers take advantage of this excursion every year, and it is accounted one of the most pleasant and profitable features of the session. Eight days are spent in the Wonderland of America. The conveyances and accommodations are first class and the total expense low.

Further information about the trip through the park will be furnished on application to the director of the Summer Session.

Rural Life Conference.

The Rural Life Conference is held July 12-14. There is a growing interest in the country life movement. Various organizations and forces are working for rural betterment. The school, the church, the farmers' club, the cooperative association and the country press are among the important factors in this movement, and workers in these activities ought to be brought into touch with each other. They must realize that there is a unity in the country life problem and that its solution depends upon cooperation on broader lines than has yet been attempted. This conference is held with a view to assisting in this work.

It is hoped that rural school workers, leaders of farmers' clubs and cooperative associations, pastors of country and village churches, Sunday School workers, editors of rural newspapers, rural social workers and others interested in rural welfare will find the program attractive. No fee will be charged for registration or for any program.

The program will consist of lectures by college professors on topics relating to the farm and home, round table discussions led by specialists in rural life problems, and lectures by eminent rural leaders.

Country Church Institute.

The Fourth Annual Country Church institute will be held for the five days, July 16-20. The institute has increased in interest and attendance from year to year and all parts of the state are represented.

This year eminent state and national leaders in the country church and social work will conduct lecture courses. College men also have an important place in the work of the institute.

Lunch will be served at noon and provision will be made for the entertainment of the ministers who attend. The complete program is issued in April.

COURSES OF INSTRUCTION.

Note—Courses marked (*) may be taken for college credit.

AGRICULTURE.

PROFESSOR, M. J. ABBEY. ASSISTANT PROFESSOR, W. O. WHITCOMB.

S1. Elementary Agriculture. 2 cr. Mr. Abbey.

Conducted by means of text-books, recitations, laboratory and farm observation. Methods of presentation in the rural school will be taught, and students will be provided with outlines. The laboratory and field work may be divided as follows, a week being given to each subject: Soils and soil fertility, field crops, animal husbandry, horticulture, poultry, the vegetable and flower garden. M. T. W. Th. F. at 9 and 11.

***S2. Crops.** 2 cr. Fee $1. Mr. Whitcomb.

A study of reproduction and germination in cereals, grasses and legumes; history, cultural methods and uses. M. T. W. Th. F. at 10.

S3. Soils. 2 cr. Fee $1. Mr. Whitcomb.

A study of reproduction and germination in cereals, grasses and legumes; history, cultural methods and uses. M. T. W. Th. F. at 10.

***S3 Soils.** 2 cr. Fee $1. Mr. Whitcomb.

The origin, formation and classification of soils and a study of modern tillage methods and the conditions affecting the soils productiveness. M. T. W. Th. F. at 1.

ARTS AND CRAFTS.

INSTRUCTOR, MISS JENNY LIND.

S1. Public School Drawing. 2 cr. Fee $1. Miss Lind.

Including pencil and crayon, water color, design in theory and practice, lettering, paper cutting. M. T. W. Th. F. at 9 and 11.

S2. Handicrafts. 2 cr. Fee $3.

Basketry, weaving, braiding, knot tying, hitches, rope splicing. M. T. W. Th. F. at 2.

BOTANY.

PROFESSOR, M. J. ABBEY. SUPERINTENDENT, M. W. WITTEN. ASSISTANT PROFESSOR, H. B. FOOTE.

S1. Elementary Botany and Montana Flora. 2 cr. Mr. Foote.

Elementary general botany. Sources of information and plans for independent study. Some special work on Rocky Mountain flora for those who are prepared to pursue the study. M. T. W. Th. F. at 10.

S2. Nature Study. 2 cr. Mr. Abbey, Mr. Witten.

The seasonal round. The economic plants; methods of collection and preservation for classroom use. The life history of insects, both harmful and beneficial, their relation to plants, animals and human beings, methods of study of this important group, bird life in its many relations to man, observation of habits and methods of feeding. This course gives the nature study outlook to agriculture. Lectures and field work supplemented by individual problems. M. T. W. Th. F. at 1.

CHEMISTRY.

PROFESSOR, W. M. COBLEIGH.

S1. Chemistry of Rural Life. 1 cr. Fee $1.50. Mr. Cobleigh.

Elementary principles of chemistry and their practical applications to rural life problems such as the soils, fertilizers, alkali, plants and their uses, insecticides, fungicides, dairy products, the manufacture, preservation and adulteration of foods, farm sanitation including the water supply, sewage disposal and ventilation. Class exercises illustrated with museum exhibits and practical lecture demonstration that teachers can use in rural schools. M. W. F. at 9.

COMMON BRANCHES.

Special classes in subjects required for a second grade certificate will be organized. Students will be required to take double amount of work in most subjects for which certificate credit is desired.

S1. a. History. M. T. W. Th. F. at 1. (Second 3 weeks).

S1. b. Geography. M. T. W. Th. at 11; F. at 3. (Second 3 weeks).

S1. c. Grammar and Composition. M. T. W. Th. F. at 8.

S1. d. Reading. M. T. W. Th. F. at 8.

S1. e. Civics. M. T. W. Th. F. at 2. (Second 3 weeks).

S1. f. Penmanship.

Theory and practice, see Rural School Organization and Management. M. T. W. Th. F. at 8 and 11.

DAIRY HUSBANDRY.

PROFESSOR, G. L. MARTIN.

***S1. Farm Dairying.** 2 cr. Fee $2. Mr. Martin.

Dairying in its general relation to the farm; selection of the cow; the dairy sire; management of the calf; building up the herd; and feeding for milk production; operation of the Babcock test; use of hand separators; ripening cream; making butter on the farm and the marketing of dairy products. M. T. W. Th. F. at 1.

EDUCATION.

PROFESSOR, J. M. HAMILTON (President). SUPERINTENDENT, M. W. WITTEN
PROFESSORS, J. H. HOLST, M. J. ABBEY. INSTRUCTOR, GERTRUDE PECK.

***S1. Elementary Psychology.** 2 cr. Mr. Hamilton.

The principles of psychology presented so as to make them of practical use in the school room, materials and methods of modern psychology. This course will prepare for the teachers' examination. M. T. W. Th. F. at 2.

***S2. Rural School Organization and Management.** 2 cr. Mr. Witten.

An adapted course in theory and practice. The program, records, alternations. The relation of the home and school through the application of the course of study. The relation of the home and school through extra mural activities. Home study and occupations. M. T. W, Th. F. at 9.

***S3. Rural Life Problems.** 2 cr. Mr. Abbey.

A study of the fundamental problems of rural life as to advantages and disadvantages of rural life, social, political, religious and educational agencies and methods of correlating the same. As the basis of the course, a survey of a typical rural community will be made. M. T. W. Th. F. at 2.

S4. Rural Primary Methods. 2 cr. Fee $1. Miss Peck.

An outline of the work to be presented, and the sequence and relation of subjects. The material and methods adapted to the rural school. A study of approved methods in presenting reading, nature study, language, numbers and penmanship in the first three grades. M. T. W. Th. F. at 1.

S5. The Playground. 1 cr.

The value of playground supervision. Apparatus for the rural playground. The classification of games best adapted to the rural playground. Actual participation in games to be used on the rural playground. M. W. Th. at 4.

HOME ECONOMICS.

INSTRUCTORS, ELFIE ROWE, ESTHER COOLEY.

S1. Foods and Cooking. 2 cr. Miss Rowe, Miss Cooley.

Lectures and laboratories, adapted to rural school. Kinds of foods as to composition and use in the body. The cost and preparation of food. Relation to hygiene and sanitation. Study of cereals, meats, milk, eggs, bread, and vegetables. The hot lunch in rural school. M. T. W. Th. F. at 10 to 12.

S2. Sewing and Textiles. 2 cr. Fee $1. Miss Cooley.

Illustration of various stitches, the drafting and making of a number of garments; and study of materials, textiles and fibres. The application of the work to the needs of the rural school is kept constantly in mind. M. T. W. Th. F. 1 to 3

HORTICULTURE.

Professor, O. B. Whipple.

***S1. School and Home Gardening.** 2 cr. Mr. Whipple.

The school garden, its aims and objects with practical demonstrations in planning, planting and caring for one. Decoration of school grounds. Principles of vegetable gardening with practice work in starting plants and transplanting and caring for such crops. M. T. W. Th. F. at 10.

MECHANIC ARTS.

Assistant Professor, R. T. Challender.

S1. Manual Training. (First year offered this year). 2 cr. Fee $1.50. Mr. Challender.

The work will be devoted to practical drawing, lettering, the use and care of tools and a series of exercises in joining. M. T. W. Th. F. 10 to 12.

***S2. Manual Training.** (Second Year, not offered this year).

Consideration of the minimum equipment for the rural school. Practical problems of direct interest. Subjects and materials. Specific plans. The making of model articles. A course for teachers who have had little or no experience with wood work in school.

PHYSICS.

S1. Elementary Physics. 2 cr.

Lecture and experimental demonstration by the instructor on the mechanics of soils, liquids and gases. A brief study of the simple elements of machinery. M. T. W. Th. at 11. F. at 3.

SPECIAL COURSES.

S1. a. Public School Music. 2 cr. Mrs. Norton, Miss Rowe.

The first twenty minutes each morning will be devoted to singing by the assembled students, and the class in music will receive instruction during the remainder of the hour, in sight singing, ear training, notation, child voice, note songs and methods of teaching. M. T. W. Th. F. at 8.

*S1. b. Hygiene and Sanitation. 1 cr. Mr. Cobleigh.

The character and location of the farm house, barns, and wells, drainage, the water supply, sources of infection. Sanitary conveniences, ventilation, personal hygiene. M. W. F. at 8.

S1. c. Rural Arithmetic. 2 cr. Mr. Holst.

A consideration of the adaptability of the various rural arithmetics. The method and subject matter necessary to relate the teaching of arithmetic to other subjects and to the farm and home. The solution of various classes of problems. M. T. W. Th. F. at 10.

*S1. d. Montana History. 1 cr. (First 3 weeks). Mr. Hamilton.

A study of such important events as the Lewis and Clark Expedition, the fur-traders, the early missionaries, Steven's explorations, the pioneers and gold discoveries, Indian campaigns, railroads, the cattle country, etc. The library has an abundance of references materials and the lectures will be illustrated with lantern slides. M. T. W. Th. F. at 1.

S1. e. Montana Civics. 1 cr. (first 3 weeks)

The State constitution, the relation of the various units of government in the State. A study of the functions and relations of the legislative, executive and judicial departments. First 3 weeks followed by a study of the federal government. M. T. W. Th. F. at 2.

*S1. f. School Law. 1 cr. (First 3 weeks.) Miss Davis.

The whole subject of school law with especial attention to the duties of a teacher as an officer of the state; school boards, care of property, contracts, records and reports. M. T. W. Th. F. at 11.

S1. g. Montana Geography. 1 cr. (First 3 weeks). Miss Bull.

A careful study of the physical features of the state and their influences on climate and industries. The industries and transportation and market. First 3 weeks followed by general geography. M. T. W. Th. F. at 11.

Roster

OF COMMANDANT, CADET OFFICERS AND CADET NON-COMMISSIONED OFFICERS.

COMMANDANT.

Clark, Hollis C.....Professor of Military Science and Tactics

ASSISTANT.

Bloss, Fred.....Assistant in Military Science and Tactics

BATTALION STAFF.

Budde, Herman.....Adjutant
Christensen, Anker L. Quartermaster
Vidal, Lawrence E. Attached
Knowles, R. C.....Quartermaster Sergeant

COMPANY A.

Officers.

Garvin, John P.....Captain
Sutherland, Edward L. First Lieutenant
Corkins, Clifford.....Second Lieutenant

Non-Commissioned Officers.

Pope, Alger W. First Sergeant
Ford, Albert D. Sergeant
Stranahan, Clinton G. Sergeant
Blickensderfer, John.....Sergeant
Davis, Russell L.....Corporal
Kohnen, John H. Corporal
MacMillan, Gregor Corporal

COMPANY B.

Officers.

Cannon, Raymond E. Captain
Manning, J. M. W.....First Lieutenant
Jolley, Lewis C. Second Lieutenant

Non-Commissioned Officers.

Burke, John J. First Sergeant
McCabe, John H. Sergeant
Johnson, Arne G. Sergeant
Stewart, Harold W. Sergeant
Taylor, Horace D. Corporal
Muntzer, Henry Corporal
Mabee, Will B. Corporal

COMPANY C.

Officers.

Undem, Louis, jr., ... Captain
Rice, Hubert M. First Lieutenant
Kelly, Jean D. Second Lieutenant

Non-Commissioned Officers.

Collett, John First Sergeant
Hoem, Arthur I. Sergeant
Mashin, Ladimir Sergeant
Taylor, Homer C. Sergeant
Fowler, L. A. Corporal
Nelson, Curtis Corporal
Berg, Sigvald L. Corporal

COMPANY D.

Officers.

Ladenberg, Carl E. Captain
Bowlen, Wayne F. First Lieutenant
Mudd, Ora C. Second Lieutenant

Non-Commissioned Officers.

Ribelin, Carter G. First Sergeant
Finlay, William F. Sergeant
Morphey, Lloyd A. Sergeant
Sessions, Gilpin S. Sergeant
McElwee, James Corporal
Humphrey, Leo C. Corporal
Gutelius, Robert S. Corporal

Register of Students 1916-1917

GRADUATE STUDENTS.

Vestal, William B., B. S.	Civil Engineering	Anaconda
Wells, Roscoe W., A. B.	Entomology & Zoology	Bozeman

GRADUATES NOT CANDIDATES FOR DEGREES.

Lessel, Erma, B. S.	Chemistry	Butte
Powell, Gregory S., A. B.	Animal Husbandry	Billings
Whitcomb, Mrs. Abigail, A. B.	Irregular	Bozeman

SENIORS.

Beerstecher, Ada	Home Economics	Belgrade
Bullock, Fred	Agronomy	Bozeman
Cannon, Raymond E	Animal Husbandry	Bozeman
Carr, Myron L.	Animal Husbandry	Bozeman
Christensen, Anker L.	Mech. Engineering	Lancaster, Wash.
Clarkson, Robert	Animal Husbandry	Chinook
Cole, Lester E.	Agronomy	Butte
Cook, Charles W.	Civil Engineering	Roundup
Cook, Donald H.	Chemistry	White Sulphur Springs
Dahl, Hilmer L.	Electrical Engineering	Belt
DeCamp, Renan	Electrical Engineering	Helena
Duquette, Jay	Electrical Engineering	Potomac
Fowler, Edith E.	Home Economics	Great Falls
Fox, Arthur P.	Agronomy	Kalispell
Garvin, John	Elec. Engineering	Osakis, Minn.
Gray, John Wright	Dairy Husbandry	Bozeman
Hansen Waldemar C.	Chemistry	Whitewood, So. Dak.
Hodgskiss, Ursula	Home Economics	Choteau
Ingram, Craig	Electrical Engineering	Helena
Jackson, Joel	Agronomy	Harrison
Jaeckel, Carl	Agronomy	Anaconda
Jorgenson, Ralph	Animal Husbandry	Fox
Kelly, Jeanette	Home Economics	Deer Lodge
Kneale, Morris T.	Civil Engineering	Bergen, N. Y.
Kretlow, Mary P.	Home Economics	Helena
Ladenburg, Carl	Electrical Enginerin,	Columbia Falls
Langohr, Don	Botany & Bacteriology	Bozeman
Linfield, Bertil	Agronomy	Bozeman
Lund, Janelle E.	Chemistry	Three Forks
Luther, Edith W.	Chemistry	Choteau

Manning, J. M. W.	Animal Husbandry	Great Falls
Milnor, Estelle	Industrial Chemistry	Troy
Monson, William	Civil Engineering	Ovando
McIver, Grace F.	Secretarial	Great Falls
McSpadden, F. E.	Agronomy	Missoula
Noble, Ruth A.	Secretarial	Great Falls
Nordquist, Clark	Agronomy	Bozeman
Rapatz, Eugene	Electrical Engineering	Havre
Reddick, Theodore	Animal Husbandry,	Hermosa, S. D.
Ronne, Edwin M.	Electrical Engineering	Chinook
Saltz, Lawrence W.	Chemistry	Dundee, Michigan
Scholten, Henry	Mechanical Engineering	Big Timber
Scott, Parke T.	Dairy Husbandry	Armstead
Sherry, C. B.	Agronomy	Camas
Snow, Manfred L.	Agronomy	Marion, Ohio
Stahlford, Ruby	Home Economics	Hamilton
Strand, Roy	Zoology & Entomology	Helena
Thomas, David S.	Civil Engineering	Great Falls
Truman, Ida Ruth	Home Economics	Bozeman
Undem, Louis	Animal Husbandry	Chicago, Illinois
Whipple, Charles A.	Animal Husbandry	Helena
Whiteside John	Electrical Engineering	Kalispell
Wilcox, Guy M.	Secretarial	Dupuyer
Young, Mrs. Verna T.	Home Economics	Butte

JUNIORS.

Abrahamson, Irene V.	Home Economics	Red Lodge
Arneson, Elmer	Animal Husbandry	Big Timber
Arneson, Harriet J.	Secretarial	Big Timber
Babbitt, Minnie E.	Home Economics	Victor
Border, Blanche	Home Economics	Bozeman
Borton, Albert J.	Agronomy	Glasgow
Borton, Carl D.	Civil Engineering	Glasgow
Bowlen, Wayne	Mechanical Engineering	Red Lodge
Brown, Mrs. Mary	Home Economics	Bozeman
Bunnell, Ercel W.	Mechanical Engineering	Bozeman
Burke, John J.	Electrical Engineering	Butte
Collett, John	Applied Art	Livingston
Corkins, Clifford L.	Zoology & Entomology	Joliet
Danielson, Mary	Zoology & Entomology	Miles City
Dickson, Harold	Animal Husbandry	Dillon
Drummond, Warren	Mechanical Engineering	East Helena
Emhoff, Elizabeth	Home Economics	Stevensville
Finlay, William	Secretarial	Bozeman
Flood, Marie F.	Home Economics	Park City
Ford, Albert D.	Mechanical Engineering	Bozeman

Glass, E. R.	Electrical Engineering	Waverly, Kan.
Gray, Helen	Home Economics	Bozeman
Hagen, Roy C.	Electrical Engineering	Great Falls
Hall, Medra	Home Economics	Bozeman
Haller, Beulah	Home Economics	Butte
Hastings, John	Electrical Engineering	Joliet
Helstrom, Carl	Civil Engineering	Anaconda
Hodgskiss, Ruby	Home Economics	Choteau
Hoem, Arthur	Mechanical Engineering	Butte
Jackman, E. Russell	Agronomy	Kalispell
Johnson, Arne G.	Animal Husbandry	Butte
Johnson, Martha I.	Home Economics	Clancy
Jolley, Lewis	Architectural Engineering	Bozeman
Kelly, Jean D.	Animal Husbandry	Anaconda
King, Kenneth M.	Zoology & Entomology	Whitehall
Kirschner, Hortense	Home Economics	Bozeman
Kuhns, Myrtle	Home Economics	Kalispell
Langohr, Louise	Home Economics	Bozeman
Luce, Llewellyn	Secretarial	Bozeman
Lund, Helen	Applied Art	Three Forks
Minar, John W.	Animal Husbandry	Butte
Mudd, Ora C.	Electrical Engineering	Fishtrap
McCabe, John H.	Electrical Engineering	Kalispell
McCone, Alice	Home Economics	Burns
Noble, Florence J.	Applied Art	Bozeman
Nye, Paul R.	Agronomy	Billings
O'Connor, Frank J.	Animal Husbandry	Red Lodge
Park, Lee	Secretarial	Bozeman
Perring, Maude	Home Economics	Salesville
Pippenger, Harold F.	Electrical Engineering	Glasgow
Pope, Alger	Mechanical Engineering	Bozeman
Quaw, Marjorie	Applied Art	Bozeman
Ribelin, Carter G.	Electrical Engineering	Polson
Rice, Hubert M.	Animal Husbandry	Kalispell
Ritz, Gladys	Chemistry	Anaconda
Roberts, Otto	Agronomy	Salesville
Ross, Thomas A.	Animal Husbandry	Chinook
Rothwell, Howe C.	Civil Engineering	Columbus
Rowe, Mary A.	Secretarial	Victor
Sewell, Gordon	Chemical Engineering	Anaconda
Sparrow, Elma	Home Economics	Anaconda
Stearns, Elvis P.	Botany and Bacteriology,	Karinen, S.D.
Stranahan, Clinton	Animal Husbandry	Fort Benton
Streets, Rupert B.	Botany & Bacteriology	Helena
Sutherland, Edward L.	Civil Enginering,	Central City, S. D.
Swan, Ulmont	Mechanical Engineering	Butte

Sweat, Jack	Agronomy	Dutton
Tubbs, Palmer H.	Civil Engineering	Elkhorn, Wis.
Wallace, Fred P.	Secretarial	Bozeman
Werre, Harold M.	Animal Husbandry	Bozeman
Woolridge, Francis	Agronomy	Chinook

SOPHOMORES.

Anderson, Bernard	Animal Husbandry	Valier
Anderson, Mabel S.	Home Economics	Valier
Armstrong, Nina	Secretarial	Big Timber
Axtell, Lucy	Applied Art	Bozeman
Baker, Ada	Secretarial	Plains
Beatty, Lura	Home Economics	Bozeman
Benepe, Lucien L.	Agronomy	Bozeman
Berg, Sigvald	Architectural Engineering	Helena
Bergman, Clarence	Secretarial	Manhattan
Loberg, Washington	Animal Husbandry	Sandy, Utah
Bunnell, Marie	Home Economics	Bozeman
Burgess, Ralph H.	Animal Husbandry	Helena
Calkins, Walter S.	Electrical Engineering	Butte
Chattin, Earl	Agronomy	Big Timber
Chattin, Lynnie	Home Economics	Big Timber
Cornish, Vivian	Secretarial	Livingston
Davidson, Paul B.	Industrial Chemistry	Bozeman
Davis, Russell L.	Animal Husbandry	Lolo
Eames, Esther M.	Home Economics	Canyon Ferry
Erwin, James Kent	Electrical Engineering	Bozeman
Fitzgerald, James	Mechanical Engineering	Bozeman
Flint, Nelson	Mechanical Engineering	Bozeman
Fowler, Leroy	Secretarial	Bozeman
Graves, Nelson	Animal Husbandry	So. Omaha, Neb.
Gray, W. David	Industrial Chemistry	Choteau
Gutelius, Robert S.	Civil Engineering	Anaconda
Hague, Sigmund	Chemical Engineering	Livingston
Hannah, John M.	Civil Engineering	Billings
Hayes, Lawrence	Electrical Engineering	Butte
Haynes, Etta	Home Economics	Boulder
Herron, Miriam	Home Economics	Bozeman
Humphrey, Leo C.	Chemistry	Holyoke, Mass.
Ingram, Doris	Home Economics	Helena
Jacoby, George	Architectural Engineering	Helena
Jones, C. Shelton	Agronomy	Cascade
Kain, Henry A.	Mechanical Engineering	Helena
Kain, Sidney C.	Mechanical Engineering	Helena
Kearns, Mary K.	Home Economics	Townsend

Knott, Georgia	Home Economics	Heron
Leckliter, Gladys	Applied Art	Salesville
Limbert, Emmet	Animal Husbandry	Two Dot
Linfield, Azalea	Home Economics	Bozeman
Mabee, Will B.	Agronomy	Glasgow
Major, Glenn	Civil Engineering	Helena
Marchion, Elmo	Mechanical Engineering	Anaconda
Mashin, Ladimir	Animal Husbandry	Chicago, Illinois
Mills, Dorothy	Home Economics	Helena
Monforton, Lucille	Home Economics	Bozeman
Morphey, Lloyd A.	Electrical Engineering	Leadore, Ida.
Muntzer, Henry P.	Electrical Engineering	Butte
Murphy, Inez	Secretarial	Polson
MacMillan, Gregor	Electrical Engineering	Butte
McDonald, Ronald E.	Chemistry	Whitehall
McElwee, James	Electrical Engineering	Bozeman
McGrew, Mrs. Marion	Home Economics	Los Angeles, Cal.
McMahon, Abraham L.	Agronomy	Glasgow
McVey, Chester L.	Electrical Engineering	Stevensville
Nelson, Curtis	Zoology & Entomology	Havre
Neville, William B.	Electrical Engineering	Helena
Noble, Daniel B.	Agronomy	Whitehall
Norcutt, Etta	Home Economics	Denton
Norris, Earl	Chemistry	Helena
Prentiss, Earle	Electrical Engineering	Hamilton
Reitz, Harold J.	Electrical Engineering	Terry
Robinson, Ernest C.	Animal Husbandry	Lewistown
Schock, Dorothy	Home Economics	Billings
Seeley, Evelyn G.	Secretarial	Bozeman
Senz, Melvin J.	Electrical Engineering	Terry
Sessions, Gilpin S.	Agronomy	Okmulgee, Okla.
Simes, Ella H.	Secretarial	Great Falls
Smith, Lois	Home Economics	Bozeman
Smith, Robert B.	Zoology & Entomology	Billings
Smith, Ruth A.	Secretarial	Bozeman
Smith, Spencer J.	Chemistry	Bozeman
Smith, Stephen E.	Agronomy	Billings
Solberg, Stella	Home Economics	Big Timber
Sparrow, Cora	Home Economics	Anaconda
Stanley, Ernest	Animal Husbandry	Whitehall
Stewart, Harold W.	Secretarial	Bozeman
Stone, Mary Louise	Home Economics	Bozeman
Stone, Parker A.	Animal Husbandry	Bozeman
Swan, Helen	Architectural Engineering	Butte
Taylor, Homer	Animal Husbandry	Clear Lake
Taylor, Horace D.	Animal Husbandry	Bozeman
Templeton, Russell	Chemical Engineering	Anaconda

Warr, Chester	Animal Husbandry	Hawarden
Waterman, Marie	Home Economics	Bozeman
Watkins, C. Lloyd	Animal Husbandry	Great Falls
Westlake, Lovitt I.	Chemistry	Bozeman
Wheeler, Mark	Animal Husbandry	Gilford

FRESHMEN.

Alderson, Priscilla	Applied Art	Helena
Alexander, Bernal H.	Secretarial	Bozeman
Angell, Marcy	Secretarial	Kalispell
Beach, Ben	Agriculture	Mitchell
Blanding, Flavia E.	Home Economics	Butte
Blickensderfer, John	Chemistry	Shelby
Bryan, Clarence A.	Agriculture	Billings
Burgess, Edna S.	Secretarial	Radersburg
Burns, James P.	Secretarial	Ashland
Burt, John L.	Agriculture	Forsyth
Bush, Elmer J.	Electrical Engineering	Pony
Carroll, Charles P.	Electrical Engineering	Dillon
Carroll, Charles W.	Electrical Engineering	Hysham
Catron, Pearl B.	Secretarial	Chariton, Iowa
Chowning, Winifred	Home Economics	Ennis
Cocks, Leslie V.	Electrical Engineering	Great Falls
Coffey, Royal A.	Architectural Engineering	Bozeman
Crum, Charles L.	Agriculture	Forsyth
Cutting, H. Everett	Electrical Engineering	Bozeman
Dawe, Enid M.	Home Economics	Sidney
DeVries, Martin	Secretarial	Roberts
Dickman, Herman L.	Agriculture	Helena
Donohue, Michael F.	Chemical Engineering	Dillon
Dougherty, Thomas F.	Agriculture	Plains
Downing, Sarah E.	Secretarial	Three Forks
Ecton, Zales M.	Secretarial	Bozeman
Fenton, Ernest E.	Secretarial	Forsyth
Finch, Fred A.	Agriculture	Dillon
Flynn, Jesse C.	Electrical Engineering	Logan
Forbes, Emma Frances	Home Economics	Helena
Fricke, Alice	Home Economics	Huntley
Galbraith, Lewis	Agriculture	Bozeman
Gibbs, Benjamin F.	Electrical Engineering	Harlowton
Green, Ruth M.	Botany & Bacteriology	Manhattan
Haffner, Frieda	Chemistry	Three Forks
Hall, Genevieve	Home Economics	Bozeman
Hannah, Georgia B.	Secretarial	Fort Benton
Hardy, Carter G.	Agriculture	Forsyth
Harris, Charles F.	Agriculture	Billings

Harris, Vera B.	Home Economics	Bozeman
Heageny, Charles E.	Agriculture	Bozeman
Henry, Forest G.	Electrical Engineering	Townsend
Herriott, Evelena	Home Economics	Thompson Falls
Hervey, John	Agriculture	Billings
Holden, Zaydah A.	Home Economics	Lebam, Wash.
Hollier, Trena	Home Economics	Bozeman
Hooper, Ethel G.	Secretarial	Lincoln
Hunsberger, Roy A.	Electrical Engineering	Fort Benton
Jaeckel, Emma Marjorie	Secretarial	Anaconda
Johnson, Bertha A.	Home Economics	Bozeman
Johnson, Jessie A.	Secretarial	Glendive
Kendall, Lytton A.	Agriculture	Sidney
Kennedy, Mary Jane	Home Economics	Helena
Kibble, Laura M.	Secretarial	Roundup
King, Ruth E.	Home Economics	Fort Benton
Knowles, Stephen A.	Agriculture	Boulder
Kohnen, John H.	Civil Engineering	Shelby
Kremer, Elsie K.	Secretarial	Belgrade
Kyle, Frances	Home Economics	Bozeman
Lamp, Elwyn C.	Electrical Engineering	Big Timber
Larse, Victor F.	Agriculture	Plains
Lease, Helen E.	Home Economics	Great Falls
Lehfeldt, Martha	Home Economics	Broadview
Leonard, Cecil E.	Agriculture	Glasgow
Lillard, John J.	Secretarial	Bozeman
Linfield, Leila	Home Economics	Bozeman
Linn, Harold F.	Chemical Engineering	Three Forks
Lippert, William C.	Agriculture	Townsend
Ludwig, Ernest E.	Electrical Engineering	Great Falls
Ludwig, Henry W.	Architectural Engineering,	Great Falls
Malvern, Edith I.	Home Economics	Watkins
Marquis, Minnie E.	Home Economics	Bozeman
Matthews, Charles S.	Civil Engineering	Butte
Mecklenberg, Walter L.	Agriculture	Billings
Michel, Henry R.	Electrical Engineering	Bozeman
Millegan, Mary E.	Chemistry	Millegan
Miller, Ida M.	Secretarial	Choteau
McConnell, Grant B.	Civil Engineering	Helena
McFarlin, Alfred E.	Chemical Engineering	Dillon
Needham, Walter J.	Architectural Eng.	Thompson Falls
Nordahl, Martin L.	Agriculture	Park City
Oberle, Henry	Electrical Engineering	Bozeman
Orvis, Reno K.	Mechanical Engineering	Salesville
O'Brien, Paul O.	Electrical Engineering	Conrad
O'Neill, W. J.	Electrical Engineering	Butte
Parker, Helen L.	Secretarial	Helena

Pickens, Russell M.	Agriculture	Huntley
Pitts, Raymond B.	Zoology & Entomology	Bozeman
Pollard, Rolla E.	Chemical Engineering	Craig
Pool, Vernie V.	Home Economics	Townsend
Powell, Dorothy E.	Home Economics	Billings
Powell, Pauline W.	Home Economics	Billings
Prescott, No+ C.	Secretarial	Belgrade
Price, Lawrence L.	Industrial Chemistry	Dillon
Price, Merwin J.	Agriculture	Ballantine
Reedy, Theodore W.	Industrial Chemistry	Mt. Carroll, Ill.
Reichelt, Jere G.	Electrical Engineering	Ft. Benton
Rickman, Ruth G.	Secretarial	Helena
Roney, Clyde E.	Electrical Engineering	Missoula
Ropes, Dorothy E.	Home Economics	Helena
Rose, Helen	Zoology & Entomology	Bozeman
Rover, Evelyn N.	Secretarial	Kalispell
Rowe, Forest F.	Agriculture	Pasadena, Cal.
Rowley, Hyacinth	Home Economics	Lewistown
Saldine, Emil J.	Civil Engineering	Great Falls
Sandberg, E. Harold	Agriculture	Collins
Schmid, Leroy P	Electrical Engineering	Butte
Schnare, Evelyn E.	Secretarial	Intake
Sessions, Addison	Agriculture	Okmulgee, Okla.
Smith, Walter	Architectural Engineering	Bozeman
Solberg, Oscar J.	Agriculture	Big Timber
Stanton, Malcolm R.	Electrical Engineering	Plains
Stearns, Frank L.	Chemical Engineerng	Great Falls
Steel, Frederick	Electrical Engineering	Great Falls
Stephenson, Harley J.	Secretarial	Belgrade
Stickler, Glenn E.	Electrical Engineering	Glasgow
Sullivan, Ella D.	Home Economics	Townsend
Sweat, Helen	Chemistry	Dutton
Switzer, Florence	Zoology & Entomology	Bozeman
Tobey, Willard H.	Agriculture	Highwood
Tyler, John L.	Chemical Engineering	Hamilton
Vidal, Lawrence E.	Agriculture	Great Falls
Vold, Nettie R.	Secretariial	Three Forks
Wakefield, Arthur R.	Agriculture	Forsyth
Walsh, Margaret	Home Economics	Helena
Walters, George W.	Mechanical Engineering	Helena
Weber, Bryan J.	Mechanical Engineering	Helena
Whiteacre, Gladys M.	Home Economics	Choteau
Winninghoff, Vincent C.	Mechanical Engineering	Phillipsburg
Winwood, Ralph	Agriculture	Butte
Wood, Marion A.	Secretarial	Bozeman
Woodward, Otto	Mechanical Engineering,	Willow Creek
Wylie, John	Mechanical Engineering	Bozeman

IRREGULARS.

Anderson, Lloyd A.	Secretarial	Bozeman
Chandler, Elizabeth J.	Secretarial	Kewanee, Illinois
Holmes, Herschel	Chemistry	Bozeman
McKinney, Eva	Secretarial	Bozeman
McRoy, Henry L.	Mechanical Engineering	Bozeman
Smith, Arleen M.	Secretarial	Bozeman

SECONDARY STUDENTS.

FOURTH YEAR

Axtell, Lillian	Home Economics	Bozeman
Berry, Robert	Mechanic Arts	Basin
Crawford, Herbert M.	Mechanic Arts	Billings
Gilman, Vergle	Mechanic Arts	Bozeman
Mahan, Rubietta	Home Economics	Anaconda
Robinson, Martha A.	Home Economics	Gregson
Scheckenbach, Frank	Mechanic Arts	Manhattan
Schurch, Edward C.	Mechanic Arts	Deer Lodge
Townsley, Edmund	Mechanic Arts	Townsend

THIRD YEAR.

Curl, Mary M.	Home Economics	Gardner
Halstead, Beebe C.	Mechanic Arts	Ashland
McKee, Archie D.	Mechanic Arts	Bozeman
Norton Elmer	Mechanic Arts	Drummond
Reed, Dorothy M.	Home Economics	Windham
Reel, Cecil	Mechanic Arts	Norris
Ross, Helen	Home Economics	Great Falls
Sievers, Ruth	Home Economics	Butte

SECOND YEAR.

Ballatine, Edward G.	Mechanic Arts	Prospect
Dedrick, Henry V.	Mechanic Arts	Billings
Ditty, Ethel	Home Economics	Bozeman
Doe, Margaret	Home Economics	Phillipsburg
Gee, Hugo L.	Mechanic Arts	Belgrade
Hagen, Mabel E.	Home Economics	Great Falls
Hereim, Elida	Home Economics	Lennep
Hill, Grace F.	Home Economics	Yellowstone Park
Jackson, Clarence	Mechanic Arts	Bozeman
Kaiser, Alma M.	Home Economics	Ronan

Kelly, Earl	Mechanic Arts	Bozeman
Kelly, Lloyd	Mechanic Arts	Bozeman
Lindsley, Marguerite	Home Economics	Yellowstone Park
Omta, Anna	Home Economics	Belgrade
Paddock, Nettie	Home Economics	Wisdom
Shand, Rachael N.	Home Economics	Windham
Williams, Horace	Mechanic Arts	Anaconda

SCHOOL OF AGRICULTURE.

THIRD YEAR.

Akerley, Stewart	Coffee Creek
Bernstein, Morris	Chicago, Illinois
Bokma, Peter	Conrad
Brady, Milton	Bozeman
Budde, Herman	Great Falls
Eberl, J. H.	Clemons
Edwards, George	Monarch
Grimes, T. Walter	Helena
Griswold, J. Howard	Brighton, Colorado
Harper, Howard	Chicago, Ill.
Harrington, Roy	Harlowton
Hasbrouck, Everett	Sheridan
Heare, Olga	Red Lodge
Lull, John S.	Summit, S. D.
Martinell, Ray	Dell
Murdock, Wallace,	Sun River
McNeil, Lester	Decker
McTucker, Nat	Dixon
Peterson, Andrew	Springdale
Pickle, Fred L.	Powell, Wyoming
Prescott, Allen	Helena
Redfield, James	Twin Bridges
Reed, Robert D.	Windham
Russell, Charles	Luther
Shreve, Bennie	Decker
Steeves, Walter	Livingston
Taylor, Leland	Hamilton
Woodley, Francis	Scobey

SECOND YEAR

Albright, Harry	Virginia City
Arkwright, Harwood	Miles City
Ball, J. M.	Edgar
Bissonnett, Howard	Gold Creek
Black, Irwin	Norris
Bowlen, Dale	Red Lodge

Burgess, Ben Helena
Conant, Chris. A. Judith Gap
Dillman, Perry G. Conrad
Gordon, Harold Jens
Gruar, John Sixteen
Johnson, Lee Belt
Knoke, Eugene Glaston
Knowles, R. C. Chico
Lathom, Earl Columbus
Moore, Roy Dutton
McSweyn, Allen Birney
Paugh, John Jeffers
Paugh, Robert Jeffers
Randolph, Dewey Grass Range
Redfield, Ralph Twin Bridges
Ryan, William Sweet Grass
Snyder, Wesley Glaston
Taylor, Raymond Cascade
Trusler, Roy Ashland

FIRST YEAR

Adams, Paul Froid
Anderson, Edwin Fox
Anderson, Robert Great Falls
Baker, Frederick V. Josephine
Baldwin, Frank Harlem
Barrows, Thomas Eugene Fort Benton
Bawden, William E. Butte
Beach, Raymond Florence
Bell, Stewart E. Eden
Bjorkman, Carl Highwood
Blough, Henry L. Winifred
Carlson, Ernest Farmington
Cheney, Clark T. Twin Bridges
Currie, Donald Bridger
Currier, Azile L. Three Forks
Currier, Edward H. Three Forks
Dahlstrom, Francis Conrad
Depuy, Warren Livingston
Doig, Donald Sixteen
Early, Hardin Bozeman
Ellis, Roy O. Scobey
Fadness, Martin S. Scobey
Fowler, Frederick Parkman, Wyoming
French, Edd A. Billings
Gard, David Chance, Wyoming

Gard, Frank Chance, Wyoming
Goldberg, Clarence Jens
Gordon, George S. Belgrade
Graeber, James Winifred
Hartla, Clinton Anaconda
Heater, Orie E. Trout Creek
Hilger, Robert Poplar
Hovick, Bennie A. Scobey
Jenks, Rolland Moore
Johnson, Carson Big Fork
Johnson, W. Earl Belt
Jouvanet, Frank Sheridan, Wyoming
Kemmis, George Sidney
Kortte, Ray Larchwood
Larson, Howard R. Larchwood
Leard, Thomas Clyde Livingston
Manix, John A. Augusta
Martinell, Paul R. Dell
Moller, C. M. Dagmar
Moore, William Phillipsburg
Neuman, Ernest Heron
O'Connell, Brian Holter
Paryzek, Adolphus Fort Benton
Peterson, Ole Geyser
Plumlee, Isaac Winifred
Randolph, Earl E. Battrick
Reynolds, Earl Fort Benton
Richardson, Clarence Powderville
Robinson, Harry F. Wyola
Rorvik, Allen Circle
Solander, Andrew E. Big Fork
Steinbach, William C. Stearns
Street, Irving Bozeman
Sutherland, Melton C. Calvert
Taylor, William C. Belgrade
Thayer, Lawrence Bearmouth
Thayer, Lester Bearmouth
Thompson, Sam B. Decker
Tow, Wilfred Box Elder
Vance, Robert B. Florence
Voegeli, Walter Bozeman
Wade, Robert Chinook
Wagner, Charles M. Cherry Patch
Walkup, Elmer J. Florence
Walton, Alfred O. Belgrade
Weaver, Charles G. Bearmouth
Wetzsteon, William R. Sula

SCHOOL OF MECHANIC ARTS.

FIRST YEAR

Brynie, Lloyd Virginia City
Cowan, Winfield S. Harlem
Dover, Charles L. Buffalo
Kent, Lyle Bozeman
Kieckbusch, Will D. Townsend
Larsen, Wallace William Larchwood
Markert, George E. Helena
Monaghan, Hugh E. Plains
Quanbeck, Henry S. Huntley
Shelley, Ermine Helena
Steinbrink, Otto C. Colubus
Wilkins, Llewellyn Kalispell

SECOND YEAR

Hulton, David Bridger
Sherlock, Wigmore Toston

SCHOOL OF HOME ECONOMICS

SECOND YEAR.

Brogelman, Henrietta Hardin
Coppock, Erma Buffalo
Gee, Edith Belgrade
Payne, Elsie Miles City
Redfield, Alta Twin Bridges

FIRST YEAR

Beach, Dorthea White Sulphur Springs
Edens, Ruthie Townsend
Gordon, Gladys Belgrade
Kieckbusch, Frances R. Townsend
McVey, Lula Olive
Paddock, Alice E. Wisdom
Sherman Rose Gilt Edge
Spencer, Dolly Malta
Wood, Rosalie Stevensville

TRACTION AND STATIONARY ENGINE COURSE.

SECOND YEAR

Graeber, Esgar Winifred
Hickey, Russell Victor
Ohlin, Enoch Huntley
Rhone, Frank Camas
Ross, Charles Townsend

FIRST YEAR

Bergman, Hugo	Cascade
Bolden, Howard	Bozeman
Brainard, Harry	Maudlow
Collett, Gerald D.	Bozeman
Davis, Paul	Stanford
DeLaney, Henry L.	Wolf Point
Giudici, Phylis I.	Dillon
Gordon, Edward A.	Bozeman
Graeber, James H.	Winifred
Herrin, Herbert L.	Lincoln
Lichwardt, Barty H.	Helena
Massa, Michael	Toston
Milhiser, Norman	Billings
McKinney, George	Helena
McReynolds, Ree	Utica
Ryan, Matthew	Sweet Grass
Thayer, John E.	Powell, Wyoming
Ward, Albert R.	Sun River
Williams, David L.	Menard
Williams, Earl L.	White Sulphur Springs

MUSIC STUDENTS.

Alderson, Priscilla	Voice, Violin	Helena
Armstrong, Mrs. V. T.	Voice	Bozeman
Arneson, Harriet	Piano	Big Timber
Axtell, Lillian	Voice	Bozeman
Babbitt, Minnie	Piano,	Victor
Bartz, Florence	Violin	Bozeman
Blair, Dorothy	Violin	Bozeman
Beatty, Lura	Voice	Bozeman
Bressler, Ruby	Piano	Bozeman
Brown, Georgia	Piano	Bozeman
Brown, Hallie	Voice, Piano	Bozeman
Budd, Elva	Piano	Bozeman
Buzard, Marian	Piano	Bozeman
Cannon, Raymond	Voice	Bozeman
Cannon, Vera	Piano	Bozeman
Chapman, Nora	Piano	Bozeman
Clark, Mary	Piano	Bozeman
Cobleigh, Winifred	Piano	Bozeman
Cooley, Elizabeth	Piano	Bozeman
Corkins, Clifford	Piano	Joliet
Cornish, Vivian	Piano	Livingston
Cramer, Leona	Violin	Bozeman

Doe, Margaret	Voice, Piano	Phillipsburg
Downey, Eugenie	Piano	Bozeman
Eberhard, Savallah	Violin	Bozeman
Emhoff, Elizabeth	Voice	Stevensville
Esgar, Rae	Piano	Bozeman
Ferguson, Maude	Voice	Bozeman
Finlay, William	Voice	Bozeman
Flood, Marie	Piano	Park City
Fowler, Edith	Piano	Great Falls
Fransham, Edna	Voice, Piano	Bozeman
Glass, E. R.	Piano,	Waverly, Kansas
Gordon, Gladys	Violin	Belgrade
Gray, Helen	Voice	Bozeman
Griffin, Juanita	Piano	Bozeman
Grupp, Meta	Piano	Bozeman
Hagen, Mabel	Piano, Vocal	Great Falls
Hagen, Roy	Piano	Great Falls
Haller, Beulah	Voice	Butte
Hall, Medra	Piano	Bozeman
Hanks, Clementine	Voice, Violin	Bozeman
Hodgskiss, Ruby	Piano	Choteau
Hodgskiss, Ursula	Piano	Choteau
Hollier, Myrtle	Piano	Bozeman
Hollier, Stella	Violin	Bozeman
Howard, Josephine	Violin	Bozeman
Hutton, Donald	Violin	Bozeman
Hutton, Dorothy	Piano	Bozeman
Jaeckel, Carl	Voice	Anaconda
Jones, Marguerite	Voice	Bozeman
Jones, Ray	Violin	Bozeman
Johnson, Bertha	Piano	Bozeman
Johnson, Martha	Piano	Clancy
Kaiser, Alma M.	Piano	Ronan
Kelley, Ellen C.	Piano	Bozeman
Kelley, Gertrude G.	Piano	Bozeman
Kelty, Edwin	Piano	Bozeman
Kennedy, Mary J.	Voice	Helena
Kibble, Laura	Voice	Roundup
King, Kenneth	Voice	Whitehall
Kirk, Christine	Piano	Bozeman
Kirschner, Hortense	Voice	Bozeman
Kremer, Elsie	Voice	Belgrade
Kuntze, Emmet	Violin	Bozeman
Kyle, Krances	Violin	Bozeman
Langohr, Louise	Piano	Bozeman
Leach, Cecil	Violin	Bozeman
Linfield, Azalea	Piano	Bozeman

Linfield, Leila	Piano	Bozeman
Lund, Helen	Violin	Three Forks
Lund, Janelle	Violin	Three Forks
Lyons, Hazel	Violin	Bozeman
Marquis, Minnie	Voice	Bozeman
Marquis, Mrs. T. B.	Piano	Bozeman
Maxwell, Lela	Ensemble	Bozeman
Milnor, Estelle	Piano	Troy
Monroe, Mrs. Enid	Piano	Bozeman
McCone, Alice	Piano	Burns
McIver, Grace	Piano	Great Falls
Nash, Mrs. W. G.	Ensemble	Bozeman
Noble, Florence	Voice	Bozeman
Noble, Ruth	Piano	Great Falls
Orvis, J. W.	Voice	Salesville
O'Donnell, Kathleen	Violin	Bozeman
Paddock, Alice E.	Piano	Wisdom
Paddock, Nettie A.	Piano	Wisdom
Park, J. C.	Voice	Bozeman
Parker, Donald	Violin	Bozeman
Patten, Mary	Violin	Bozeman
Pease, Edith	Piano	Bozeman
Phillips, Edna	Violin	Bozeman
Phillips, Madeline	Ensemble	Bozeman
Plew, Maurine	Piano	Bozeman
Powell, Gregory	Voice	Billings
Quaw, Eugene	Piano	Bozeman
Quaw, Marjorie	Piano	Bozeman
Reed, Dorothy	Piano	Windham
Ribelin, C. G.	Voice	Polson
Ritz, Gladys	Voice	Anaconda
Robinson, Harry	Violin	Bozeman
Rose, Helen	Voice	Bozeman
Rutledge, Leona	Violin	Bozeman
Sacket, Nona	Piano	Bozeman
Shand, Rachael M.	Piano	Bozeman
Sievers, Ruth	Piano, Vocal	Butte
Smith, Alberta	Voice	Bozeman
Smith, Mrs. D. D.	Voice	Bozeman
Spencer, Dollie	Piano	Malta
Taylor, Raymond	Violin	Cascade
Wylie, Ruth	Piano	Bozeman
Young, Ethel	Piano	Bozeman
Zorn, Idella	Piano	Bozeman

SUMMER SESSION.

Abercrombie, Alice Red Lodge
Armstrong, Irene V. Kansas City, Missouri
Arnold, Alice Bozeman
Barrett, Florence East Jordan, Michigan
Bates, Estella St. Paul, Nebraska
Benham, Mrs. Mary J. Salesville
Berg, Rose S. Clayton, Wisconsin
Brown, Mrs. Fred Bozeman
Byars, Jimmye Goe Valier
Carroll, Edna Hysham
Charlton, Queenie Valier
Cook, D. H. White Sulphur Springs
Cooke, Maude H. Belgrade
Craig, R. S. Collins
Cummings, Elsie M. Bridger
Davis, James Lawrence Bozeman
Dean, Eva G. Livingston
DePann, Mrs. B. Great Falls
Dunbar, Mrs. Ada L. Geraldine
Elsom, Mary Bozeman
Farrington, Lora Columbia Falls
Fitzsimmons, Stella Bozeman
Fletcher, Marion Elizabeth Sheridan
Fries, Scott W. Butte
Gatton, Walter Bozeman
Gray, Florence Bozeman
Hagland, Signa Marie Cut Bank
Ham, Frank W. Bozeman
Hanks, Clementine Bozeman
Harris, George M. Worden
Hartney, Katherine W. Dupuyer
Henderson, Gladys Big Sandy
Henderson, Ina D. Big Sandy
Howard, Cortland Bozeman
Hubbard, Mabel Elsie Clarkson, Michigan
Huff, John Franklin Klein
Hull, Viola Bozeman
Hurst, Ida St. Thomas, North Dakota
Hytree, E. C. Bozeman
Keyser, Elsie M. Bozeman
Knott, Georgia Heron
Kountz, Ida E. Bozeman
Kremer, Mrs. Harry Bozeman
Larkin, Erma Belgrade
Lutken, Thomasine Bozeman
Mattson, Selma Sand Coulee

Mickelsen, Ruth A. Savage
Moore, Inez Bozeman
Morgan, Nan J. Bozeman
Moser, Margaret E. Terry
McRoberts, Edith Bozeman
McNichols, Marion Anaconda
Olmstead, Maurine V. Mildred
Page, Mrs. Sadie Wibaux
Peterson, Violet Worden
Provinse, Estella Red Lodge
Rosenberg, Mabel Bozeman
Russell, Ethel Bozeman
Schwalbee, Gertrude Bozeman
Slavens, Opa Stickley
Snyder, Marjorie Big Timber
Thorpe, Elizabeth Salesville
Ulsaker, Ida M. Kindred, North Dakota
Ulsaker, Mabel C., ... Kindred, North Dakota
Underwood, Millard K. Acme, Wyoming
Webster, Jessie Bozeman
Wilson, Elva Bozeman
Wilson, Kathleen Bozeman
Wiseman, Clara Moore
Woodward, Nina Willow Creek
Young, Mrs. Verna Butte

MINISTERS' WEEK.

Ayre, P. L. Miles City
Barnes, Joseph A. Wisdom
Beers, Wayland L. Big Sandy
Billingsey, J. A. Butte
Bovard, Charles L. Helena
Burton, A. L. Helena
Chapman, A. L. Bozeman
Chappel, H. E. LaConner, Washington
Cheesman, J. F. Manhattan
Clark, L. G. Helena
Cooley, Everet M. Lewistown
Cress, Clifford G. Lewistown
Dunn, A. C. Billings
Faber, William F. Helena
Ferris, John O. Minneapolis, Minnesotta
France, J. B. Belgrade
Gold, James D. Browning
Hamant, N. E. Fort Shaw
Harris, Charles W. Bozeman
Jones, Everett L. Gilman

Jordan, Walter M. Butte
Lyman, H. E. Great Falls
Mecklenburg, George Billings
Mecklenburg, H. C. Three Forks
Newman, Robert W. Missoula
Oberholtzer, H. I. Bozeman
Page, Edward H. Glasgow
Parker, J. E. Bozeman
Parsons, H. C. Helena
Perkinson, S. D. Salesville
Pillsbury, Harris Deer Lodge
Powell, G. J. Billings
Ratsch, Paul E. Belgrade
Sloan, W. N. Helena
Smith, Clark M. Kalispell
Smith, Edward Bozeman
Smith, R. R. Bozeman
Snowden, J. M. Bozeman
Swisher, E. D. McAllister
Tenney, C. W. Helena
Tuttle, A. R. Bozeman
White, George W. Polson
Wilson, Lawrence A. Butte

FARMERS' WEEK AND FARM MARKET CONGRESS.

Allison, Francis E. Wilsall
Anderson, E. W. Plentywood
Anderson, Mrs. P. J. Conrad
Anderson, P. J. Conrad
Atkins, Mrs. J. C. Salesville
Atkins, J. C. Salesville
Atkinson, Mrs. Alfred Bozeman
Axtell, C. E. Salesville
Babcock, Mrs. G. L. Gibson
Babcock, G. L. Gibson
Badgley, S. B. Salesville
Beach, Allan A. Mitchell
Bennet, R. L. Wilsall
Biering, John B. Bozeman
Blair, Mrs. Frank Bozeman
Blair, F. S. Bozeman
Blake, Agnes Lee Billings
Blankinship, E. V. Bozeman
Boddy, Mrs. Ed. F. Gibson
Boddy, Ed. F. Gibson
Bogue, Mrs. R. H. Bozeman
Bokma, Fred F. Columbus

Bosma, Joseph Manhattan
Brandenburg, A. M. Salesville
Brannan, Mrs. L. A. Columbus
Brannan, L. A. Columbus
Britan, Mrs. Olive Wilsall
Brolin, Jonas Sioux Falls, South Dakota
Brownell, W. I. Belgrade
Bulen, J. M. Bozeman
Bullard, Mrs. Hattie Bozeman
Bumgarner, Mrs. M. Fife
Bumgarner, Clark Fife
Bunnell, Mrs. W. Bozeman
Buttleman, Mrs. William Bozeman
Campbell, J. Roy Missoula
Carlson, Emily Farmington
Carlson, John A. Farmington
Chappell, R. M. Bozeman
Chase, E. L. Bozeman
Chattin, Earl W. Bozeman
Cheney, Harold H. Belgrade
Clark, Mrs. Hollis E. Bozeman
Clarkson, Robert H. Chinook
Cleavel, H. A. Norris
Collins, Roy D. Fairview
Conant, Mrs. O. F. Judith Gap
Conkling, Mrs. Leon D. Bozeman
Cook, George H. Bozeman
Courtney, Mrs. Dora Belgrade
Courtney, W. J. Belgrade
Cowan, Mrs. Elsie Bozeman
Crawford, S. C. Red Lodge
Crouch, Leslie B. Finch
Cumming, Forest Drummond
Cunningham, Mrs. R. J. Bozeman
Currier, E. H. Three Forks
Cuykendall, R. N. Aberdeen, South Dakota
Damerell, E. H. Bozeman
Davis, J. M. Choteau
Davis, R. E. Willow Creek
Dawe, L. Sidney
Dean, Mrs W. E. Bozeman
DeBoer, Jacob Three Forks
Dehler, A. G. Helena
Deschamps, A. R. Missoula
Donohoe, J. F. Whitehal
Draper, E. W. Red Lodge
Duncan, Mrs. Scott Belgrade
Duncan, Scott Belgrade

Dunn, Thomas Livingston
Ecton, Mrs. A. S. Bozeman
Edmiston, Miss Bozeman
Elam, Mrs. Mary Salesville
Elam, Mary Salesville
Ellingson, A. J. Roundup
Evans, Mrs. N. P. Bozeman
Everson, Harriet Bozeman
Ferguson, W. M. Bozeman
Fitzgerald, James J. Salesville
Fitzsimmons, T. J. Bozeman
Ford, William Clarence Salesville
Foster, Glen L. Helena
Fowler, C W. Billings
Francis, Lawrence Wilsall
Froebe, Frank J. Helena
Gaffney, P. H. Bozeman
Gard, H. C. Townsend
Gordon, E. G. Lethbridge, Alberta
Gottschalck, Mrs. Carl Bozeman
Graeber, W. A. Winifred
Green, Mrs. J. A. Bozeman
Griffin, P. H. Drummond
Hannah, W. J. Big Timber
Hansen, Ralph Columbus
Harrer, Henry Belgrade
Hart, R. E. East Helena
Harwood, Lou Willow Creek
Harwood, W. A. Willow Creek
Hedrick, Mrs. Mary Bozeman
Henderson, St. Clair F. Menard
Higgins, R. G. Ringling
Hiner, John M. Reed Point
Hiner, Omer C. Reed Point
Hoell, Mrs. J. H. Bozeman
Hoffman, Mildred L. Columbus
Holgate, Mrs. G. Sheridan
Holgate, F. G. Sheridan
House, Frank Bozeman
Howell, J. H. Bozeman
Howitt, Alexander Harlowton
Hudson, Clifton W. Norris
Hudson, Francis Norris
Hudson, Herbert C. Norris
Hudson, Nathaniel R. Livengood, Alaska
Huffine, Floyd Denton
Hughes, Rollin H. Silesia
Hunter, James Miles City

Hurad, Walter Willow Creek
Hutton, Homer Jeffers
Jackson, Ernest W. Harrison
Jensen, Edith Bozeman
Johnson, Mrs. Louis J. Bozeman
Jones, J. H. Cascade
Jones, Mrs. Mary A. Bozeman
Jones, Thomas L. Cascade
Jones, William H. Bozeman
Jordan, W. O. Bozeman
Kazell, Laura M. Big Timber
Keene, Gray P. Townsend
Kelley, Clayborne L. Carter
Kenck, Max W. Silverbow
Kiefer, Mrs. John Bozeman
Kirk, Grace Bozeman
Kirk, Henry M. Bozeman
Kirk, Thomas S. Bozeman
Knadler, A. P. Bozeman
Knowles, Ferdinana F. Hunter's Hot Springs
Korab, Frank H. Great Falls
Kountz, Joseph, jr., ... Whitehall
Kremer, John H. Belgrade
Lartz, Fred H. Absarokee
Lartz, Mrs. Sadie Absarokee
Lawrence, F. M. Missoula
Lawrence, S. F. Hardin
Lewis, George M. Manhattan
Lillard, Mrs. A. J. Bozeman
Lillard, M. R. Bozeman
Linhoff, Frank, ... Highwood
Lott, Mrs. Mortimer J. Twin Bridges
Lott, M. J. Twin Bridges
Love, Henry Culbertson
Lukkes, Jacob C. Columbus
Lyon, Esse Forest Grove
Lyon, Frank O. Forest Grove
Lyon, Harry H. Forest Grove
Lyon, Mary E. Forest Grove
Malmburg, Mrs. O. Bozeman
Marble, J. T. Bozeman
Martin, A. M. Belgrade
Martin, Archie M. Belgrade
Maryott, J. L. Roberts
Mason, Joseph A. Absarokee
Maynard, E. A. Bozeman
Magee, Mrs. L. E. Bozeman
Megee, L. E. Bozeman

Meger, Elmer Bozeman
Mendelson, Hans, ... Denver, Colorado
Metcalf, W. F. Bozeman
Milhiser, Mrs. C. S. Billings
Milhiser, C. S. Billings
Miller, H. L. Homestake
Minard, Mrs. T. Bozeman
Monforton, R. E. Salesville
Monforton, Mrs. R. Salesville
Moore, E. J. S. Bozeman
Moore, Mrs. W. T. Salesville
Moore, W. T. Salesville
Murdock, W. S. Stevensville
Murray, Henry Hobson
McClure, Ara M. Merino
McCollough, George Belgrade
McCormick, Clarence Polytechnic
McDonald, T. P. Billings
McGees, I. S. Belgrade
McGrew, Mrs. W. E. Bozeman
McGrew, William E. Bozeman
McHose, H. H. Edgar
McIntosh, Mrs. D. M. Lombard
McIntosh, Mrs. R. D. Lombard
McIntosh, R. D. Lombard
McKay, J. R. Miles City
McReod, W. W. Bozeman
McVey, Mrs. W. B. Bozeman
Nebel, Anna Bozeman
Norman, Hugo W. Belgrade
Nutting, L. A. Laurel
Olson, Mrs. J. L. Bozeman
Olson, J. L. Bozeman
Osgood, S. V. Stanford
O'Connell, George H. Salesville
Page, Clayton W. Wibaux
Page, Roy C. Wibaux
Parker, J. E. Bozeman
Parker, P. M. Bozeman
Parker, Mrs. P. M. Bozeman
Parker, Perry M. Bozeman
Parsons, J. P. Columbus
Parsons, Mrs. Zadia Columbus
Payne, J. M. L. Clyde Park
Pederson, Charles Sidney
Peets, John M. Bozeman
Pickens, L. W. Huntley

Pierce, C. C. Bridger
Potter, Mrs. W. O. Bozeman
Potter, W. J. Bozeman
Poultar, Luther A. Wilsall
Pound, Edward O. Lavina
Pound, Robert T. Lavina
Price, J. C. Ballatine
Ravet, A. J. Bozeman
Reese, T. L. Salesville
Richards, Roy L. Bozeman
Roberts, Beatrice Townsend
Roberts, Mrs. J. M. Townsend
Roberts, J. M. Townsend
Root, N. D. Whitehall
Rosenberg, C. W. Bozeman
Ross, Charles Townsend
Ross, J. C. Townsend
Rutherford, John A. Belt
Rutledge, Mrs. A. T. Bozeman
Ryan, Mrs. M. Bozeman
Sandvig, J. H. Archer
Scanlon, Edward Manhattan
Schmidt Mrs. Otto E. Bozeman
Schrecengost, Mary Manhattan
Scott, Fred Prairie Elk
Seamans, Mrs. Arthur Huntley
Secton, Scott Bozeman
Sell, Ben F. Bozeman
Selleck, Thomas J. Roscoe
Seright, Paul Joliet
Shadoan, Howard Belgrade
Shadoin, Fred H. Bozeman
Shannon, J. M. Twin Bridges
Shea, Mrs. H. M. Bozeman
Sigime, K. K. Wilsall
Sillman, A. Z. Salesville
Sime, Mrs. C. E. Bozeman
Sime, C. E. Bozeman
Simmons, Henry D. Briston
Singer, Mrs. Clara Bozeman
Skank, J. E. Salesville
Sleares, Mrs. John W. Salesville
Slavoy, Ralph Park City
Smail, Ray Arrow Creek
Smail, Ward Arrow Creek
Smith, Alberta Bozeman

Smith, B. F. Fromberg
Smith, Mrs. Veva Townsend
Spring, G. W. Belgrade
Stearns, John W. Salesville
Stevensville, B. N. Dillon
Stiff, Annis L. Wilsall
Stiff, Noah Wilsall
Stone, Susie S. Bozeman
Stoneman, John H. Blackfoot, Idaho
Symonds, T. W. Bozeman
Thayer, Winifred A. Bearmouth
Theisen, Frank Bozeman
Thompson, Homer Three Forks
Thompson, Walter C. Wilsall
Tice, Maud Logan
Tice, Mrs. Thomas D. Logan
Tice, Thomas D. Logan
Tillson, George Toston
Van Essen, C. Stevensville
Walton, Mrs. Edith C. Belgrade
Walton, John W. Belgrade
Waring, C. Acton
Waring, Esta K. Acton
Warr, Harold Geraldine
Webster, G. H. White Sulphur Springs
Wetzsteon, L. Sula
Wetzsteon, William Sula
Whitcomb, Abigail Bozeman
Whitney, Albert R. Belgrade
Willard, D. E. St. Paul, Minnesota
Williams, Mrs. Elmer Bozeman
Williams, Elmer Bozeman
Wilson, Mrs. R. O. Bozeman
Winter, David Ringling
Woll, J. A. Whitehall
Wylie, John Bozeman
Wyne, Frank Whitehall
Yates, L. P. Fishtail
Yates, L. W. Fishtail
Yergey, Alford Bozeman

Summary of Registration

	1915-16			1916-17		
	Men	Women	Total	Men	Women	Total
Graduate Students	0	0	0	2	0	2
Graduate Students not Candidates for degrees	9	0	9	1	2	3
College of Agriculture	83	0	83	88	0	88
College of Engineering	80	0	80	103	1	104
College of Applied Science	21	11	32	24	9	33
College of Household and Industrial Arts	10	92	102	18	111	129
School of Home Economics	0	35	35	0	31	31
School of Mechanic Arts	56	0	56	56	0	56
School of Agriculture	106	0	106	125	0	125
School of Music	27	83	110	19	94	113
Total	392	221	613	436	248	684
Summer Session	28	99	127	11	60	71
Ministers' Week	41	0	41	43	0	43
Farmers' Week	196	82	278	223	76	299
Total	657	402	1059	713	384	1097
Counted Twice	23	57	80	16	51	67
Grand Total	634	345	979	697	333	1030

SUMMARY BY COUNTIES AND STATES.

Beaverhead County	17
Bighorn County	6
Blaine County	9
Broadwater County	25
Carbon County	24
Cascade County	48
Choteau County	19
Custer County	11
Dawson County	4
Deer Lodge County	17
Fergus County	37
Flathead County	18
*Gallatin County	359
Granite County	10
Hill County	4
Jefferson County	14
Lewis & Clark County	56
Lincoln County	1
Madison County	27
Meagher County	15
Missoula County	9
Musselshell County	6
Park County	22
Phillips County	1
Powell County	7
Ravalli County	18
Richland County	8
Rosebud County	12
Sanders County	16
Sheridan County	11
Silver Bow County	26
Stillwater County	22
Sweet Grass County	14
Teton County	28
Toole County	5
Valley County	8
Wibaux County	3
Yellowstone County	40
Total Montana	977
Other States	53
Grand Total	1030

*Note—The 359 Students from Gallatin County were enrolled in the college as follows:

Summer Session	26
Farmers' Week	144
School of Music	54
Ministers' Week	13
College Courses	95
Secondary Courses	27
	359

Alumni

With Their Years, Degrees and Present Addresses and Occupations.

Abell, Tracy, H., B. S., 1915; Graduate student Oregon Agricultural College, Corvallis, Oregon.

Alderson, Myrtle, B. S., 1913; Bozeman, Montana, Station Clerk.

Allen, Elbert, B. S., 1903; City Attorney, Livingston, Montana.

Allen, Mollie, B. S., 19 6; Instructor in Domestic Science, Beaverhead County High School, Dillon, Montana.

Alward, Mary L., B. S., 1908; Teacher in Gallatin County High School, Bozeman, Montana.

Annin, James T., B. S., 1911; Part Owner Columbus News, Columbus, Montana.

Baker, Florence, B. S., 1912; Deceased.

Baker, Harold E., B. E. E., 1907; Superintendent Electric Power Company, Naches, Washington.

Bancroft, Raymond E., B. S., 1911; Horticultural Inspector, Billings, Montana.

Barnard, Robert B., B. S., 1910; Anaconda Copper Mining Company, Anaconda, Montana.

Batch, Otto, B. S., 1916; Homesteader, Mitchell, Montana.

Bell, James C., B. S., 1911; Farmer, Darby, Montana.

Benton, Ralph B., B. S., 1906; United States Bureau of Biological Survey, Los Angeles, California.

Blessing John, B. S., 1912; Farmer, East Helena, Montana.

Bole, Margaret, B. S., 1913; Clerk, Bozeman Daily Chronicle office, Bozeman, Montana.

Bole, William S., D. B. S., 1906; Physician and Surgeon, Bozeman, Montana.

Booker, Clinton F., B. S., 1911; Superintendent Great Falls and Missouri River Substations, Montana Power Company, Butte, Montana.

Border, Ernest, B. S., 1916; Instructor in Agriculture, Beaverhead County High School, Dillon, Montana.

Borthwick, Alberta, B. S., 1916; House Director, Ceres Hall, North Dakota Agricultural College, Fargo, North Dakota.

Brabrook, Ralph, B. S., 1913; Directing Department, American Bridge Company, Chicago, Illinois.

Breneman, Annie T., B. S., 1907; Instructor in Mathematics, Teton County High School, Choteau, Montana.

Brewer, Lucille, B. S., 1909; Instructor in Home Economics, Cornell University, Ithaca, New York.

Brook, Thomas B., B. S., 1913; Working in Garage, Twin Bridges, Montana.

Brooks, Roland, B. S., 1915; Farm Loan Representative, The Banking Corporation of Helena, Choteau, Montana.

Brown, Archie S., B. S., 1910; Electric Expert, United States Navy; Mare Island Navy Yards, San Francisco, California.

Brown, Edith E., B. S., 1904; Mrs. John Milloy, Regina Sask., Canada.

Buckley, Thomas W., B. S., 1914; Chairman, B. H. & P. R. R., Anaconda, Montana.

Bull, Edna, B. S., 1909; Mrs. G. W. Kirscher, Townsend, Montana.

Bull, Frieda M., B. S., 1907; M. S., 1909; Instructor in Mathematics, Montana State College, Bozeman, Montana.

Burke, Edmund, B. S., 1907; Chemist and Meteorologist, Montana Agricultural Experiment Station, Bozeman Montana.

Burket, Alonzo D., 1915; Chemist, Three Forks Portland Cement Company, Trident, Montana.

Butter, Donald, B. S., 1909; Electrical Engineer General Electric Company, Schenectady, New York.

Caldwell, Thomas O., B. A. C., 1899; Lewistown, Montana.

Carmichael, Effie, B. S., 1910; Mrs. Vergil A. Spicer, Red Oak, Iowa.

Carr, Irene H., B. S., 1911; Mrs. Claude Meserve, North Bridgton, Me.

Chaffee, Sarah, B. S., 1906; Mrs. Rudolph Beseke, Rathdrum, Idaho.

Chestnut, Lula, B. S., 1916; Havre, Montana.

Clark, Ben A., B. S., 1911; Farmer, Springdale, Montana.

Clarke, Grace, B. S., 1911; Missionary, Old Umtali, Rhodesia, Africa.

Clark, Olive, B. S., 1913; Bozeman, Montana.

Cockrel, Irvin, B. S., 1900; Osteopath Physician, New York City.

Coffey, Hazel C., B. S., 1915; Instructor in Home Economics, Montana Wesleyan, Helena, Montana.

Collins, Walter E., B. S. ,1902; Attorney and Trust Officer, Daly Bank and Trust Company, Butte, Montana.

Cook, George, B. S., 1912; Farmer, Bozeman, Montana.

Cooke, Amy, B. S., 1908; Mrs. George Ambrose, Mackey, Idaho.

Cooley, Esther Belle, B. S., 1916; Instructor of Domestic Science, Thompson Falls High School, Thompson Falls, Montana.

Cotner, Victor, B. S., 1916; Testing Engineer, City Engineer's Office, Billings, Montana.

Cowan, Lewis, B. C. E., 1904; Civil Engineer, Bozeman, Montana.

Cullum, Georgia, B. S., 1914; Mrs. George Roosevelt, Ackley, Iowa.

Dahl, Hilmar, B. S., 1916; Graduate Student, Montana State College.

Daly, Freeman, B. S., 1912; Civil Engineer, Chouteau, Montana.

Davidson, Lyndall P., B. S., 1915; Chemist, Anaconda Copper Company, Anaconda, Montana.

Davidson, Mary E., B. S., 1910; In Settlement Work, Chicago, Illinois.

DeMuth, Maude S., B. S., 1907; Mrs. W. D. Tallman, Bozeman, Montana.

DeMuth, David R., B. S., 1910; Deceased.

Donaldson, Noble C., B. S., 1912; Assistant in Grain Investigation of United States Department of Agriculture, Moccasin, Montana.

Douglas, Stanley, B. S., 1913; Montana Power Company, Canyon Ferry, Montana.

Draper, Charles H., B. S., 1912; Editor Carbon County Journal, Red Lodge, Montana.

Driscoll, William J., B. S., 1908; Civil Engineer, Lawrence, Massachusetts.

Dusenbury, Inez, B. S., 1912; Teacher, Bozeman, Montana.

Eberle, Alfred M., B. S., 1915; Manager Dan C. MacKay Stock Ranch, Willard, Montana.

Eckles, Mildred A., B. S., 1914; Instructor in Home Economics, Thompson Falls, Montana.

Edsall, William, B. S., 1911; Syndicate Representative, Westinghouse Electric Company, 165 Broadway, New York City.

Edward, Timothy, B. S., 1909; County Surveyor, Oro Fino, Idaho.

Edwards, Margaret, B. S., 1912; Dietitian, Florida State College, Tallahasse, Florida.

Ellis, Edward M., B. S., 1911; General Electric Company, Los Angeles California.

Everett, Inez, B. S., 1914; Mrs. Ed Schimmele, Pine City, Minnesota.

Fisher, Charles M., B. S., 1908; Electrical Engineer, Washington Water Power Company, Spokane, Washington.

Fisher, Helen, B. S., 1910; Mrs. Fred Willson, Bozeman, Montana.

Fiske, John M., B. S., 1915; General Electric Company, Lynn, Massachusetts.

Flager, Harold J., B. E. E., 1907; Statistician for Puget Sound Traction, Light and Power Company, Spokane, Washington.

Flager, Howard A., B. E. E., 1906; Confectionery Business, Seattle, Washington.

Flager, Ruth, B. S., 1910; Mrs. Carl Widener, Bozeman, Montana.

Flaherty, Charles D., B. C. E., 1904; Farmer, Cold Springs, Montana.

Flanders, Clara M., B. S., 1914; Mrs. William Vestal, Anaconda, Montana.

Fletcher, Elizabeth M., B. S., 1916; Teacher, Manhattan, Montana.

Ford, Arthur, B. S., 1916; Mechanician T. C. Power's Garage, Helena, Montana.

Foster, Florence, B. S., 1896; Mrs. Burton Flemming, Iowa City, Iowa.

Fowler, Viola, B. S., 1915; Stenographer, Bozeman, Montana.

Fox, Hazel, B. S., 1910; Mrs. Bryam Mayfield, Enterprise, Oregon.

Freeman, Beatrice B., B. S., 1900; Mrs. Thomas Davis, Absarokee, Montana.

Freeman, William B., B. S.,; 1903; Consulting Engineer, Denver, Colorado.

Froebe, Frank J., B. S., 1911; Montana Power Company, Helena, Montana.

Gardiner, Henry C., B. S., 1903; Veterinarian and Agriculturist, Anaconda Copper Mining Company, Anaconda, Montana.

Goodson, Anna, B. S., 1915; Teacher of Home Economics, High School, Anacortes, Washington.

Gordon, Fred E., B. S., 1913; Assistant Manager Land Department, Anaconda Copper Mining Company, Anaconda, Montana.

Gottschalck, Carl, B. S., 1909; M. S., 1910; Assistant in Chemistry, Montana State College, Bozeman, Montana.

Gray, Wilson, B. S., 1915; Rancher, Choteau, Montana.

Gray, Florence E., B. S., 1915; Instructor in Mathematics, Broadwater County High School, Townsend, Montana.

Griffith, Warren J., B. E. E., 1907; Chief Electrician, Klemmer Theater Spokane, Washington.

Grimes, W. Walter, B. S., 1915; Assistant Engineer, Anaconda Copper Mining Company, Anaconda, Montana.

Hagerman, Edna, B. S., 1912; Instructor in Home Science, Great Falls, Montana.

Haines, William T., B. S., 1911; Graduate Student Massachusetts Institute of Technology, Boston, Massachusetts.

Ham, Frank W., B. S., 1903; M. S., 1905; Professor of Physics, Montana State College, Bozeman, Montana.

Hamilton, Everett A., B. S., 1911; Chief Operator Madison River Power Company, Norris, Montana.

Hansen, Charles L., B. S., 1914; Bozeman, Montana.

Harmon, Ella M., B. S., 1914; Instructor in Home Economics, Fergus County High School, Lewistown, Montana.

Hartman, Brooke, B. S., 1913; Bookkeeper, Empire Bank and Trust Company, Lewistown, Montana.

Hartman, June, B. S., 1910; Instructor in Music, Montana State College, Bozeman, Montana.

Hartman, Lois K., B. S., 1.0[illegible]; Teacher Government Schools, Ancon, Canal Zone.

Hartman, Ruth, B. S., 1913; La Barthe Pianoforte Schools, Chicago, Illinois.

Hartman, Will, B. S., 1908; City Engineer, Livingston, Montana.

Hawkins, P. H., M. S., 1903; Banker, Absarokee, Montana.

Heageney, William F., B. S., 1916; Field Agriculturist, Great Western Sugar Beet Company, Lovell, Wyoming.

Heighton, Pearl A., B. S., 1914; Hospital Work, Seattle, Washington.

Henderson, Charles F., B. S., 1910; Westinghouse Electrc Company, Pittsburg, Pennsylvania.

Henderson, Lisle, B. S., 1909; Electrical Engineer, Montana Reservoir and Irrigation Company, Helena, Montana.

Higgins, Lucille, B. S., 1911; M. S., 1912; Mrs. C. S. Norton, Jr., Bozeman, Montana.

Hill, Lewis L., B. S., 1914; Section Engineer, United States Engineering Department, Yellowstone Park, Wyoming.

Hind, Bert S., B. S., 1909; Superintendent Power Plant, Madison River Power Plant, Thompson Falls, Montana.

Hinman Ruth, B. S., 1912; Teacher, Three Forks, Montana.

Hodgkiss, John E., B. S., 1912; M. S., 1913; Farmer, Choteau Montana.

Hodgskiss, John L., B. S., 1912; M. S., 1913; Farmer, Choteau, Montana.

Hollier, Georgia, B. S., 1915; Stenographer, Livingston, Montana.

Homann, Fred C., B. S., 1916; Instructor in Machine Work, Montana State College, Bozeman, Montana.

Hutton, Fred, B. E. E., Deceased.

Jacobs, Edward B., B. S., 1916; Assistant Physical Director and Boy's Secretary, Y. M. C. A., Bozeman, Montana.

Jacobs, Lillian, B. S., 1910; Mrs. Arie DeGroot, Three Forks, Montana.

James, John S., B. S., 1909; Engineer, Montana Reservoir and Irrigation Company, Cascade, Montana.

Jones, Burle J., B. S., 1904; Plant Pathologist, Nevada City, Nevada.

Jones, Kyle, B. S., 1912; Assistant Cashier, First State Bank, Bynum, Montana.

Jones, Ray S., B. S. 1915; Assistant Chemist Experiment Station, Montana State College, Bozeman, Montana.

Jones, Wyatt Wagner, B. S., 1901; M. S., 1902; Plant Pathologist for American Smelting & Refining Company, Salt Lake City, Utah.

Kelly, Martin, B. S., 1916; Civil Engineer, Anaconda Copper Mining Company, Anaconda, Montana.

Kelly, Robert T., B. S., 1915; Draughtsman, Amalgamated Copper Company, Anaconda, Montana.

Kenck, Max W., B. S., 1914; Homesteader, Silverbow, Montana.

Kennard, Eveleen M., B. S., 1915; Mrs. Alfred Eberle, Willard, Montana.

Kennedy, Cyril C., B. S., 1910; Power Plant Operator, Great Falls Power Company, Great Falls, Montana.

Kiefer, James A., B. S., 1914; Instructor in Physics, Montana State College, Bozeman, Montana.

Kimpton, Addie, B. S., 1910; Mrs. James H. Conrad, Toston, Montana.

King, Lowell, B. S., 1904; Construction Engineer, Electric Railroad, Davenport, Iowa.

King, Ruby E., B. S., 1909; Mrs. George Hogan, Musselshell, Montana.

King, Willard V., B. S., 1910; Entomological Assistant, United States Bureau of Entomology; Spotted Fever Tick Investigation. New Orleans, La.

Kinney, Edward C., B. C. E., 1907; United States Reclamation Service, Dixon, Montana.

Kinsella, Olive, B. S., 1916; Aberdeen, South Dakota.

Kirk, Grace, B. S., 1911; Instructor in Home Science, Bozeman Public Schools, Bozeman, Montana.

Kirk, Mary E., B. S., 1906; Mrs. Ermine Potter, Corvallis, Oregon.

Kirscher, W. Guy., B. S., 1909; Farmer, Townsend, Montana.

Koch, Elers, B. S., 1901; Supervisor Forest Service, Missoula, Montana.

Kremer, William J., B. S., 1910; General Manager Pine View Irrigation Company, Ennis, Montana.

Lamme, Maurice A., B. S., 1903; Director of Geology and Mineralogy, Government University, Montevideo, Uruguay, S. A.

Lannin, Earl A.., B. S., 1912; Electrical Engineer, Montana Power Company, Lewistown, Montana.

Leinard, Ford B., B. S., 1914; Homesteader, Edwards, Montana.

Lescher, Taylor, B. S., 1916; Apprentice, Westinghouse Electric Company, East Pittsburg, Pa.

Lessel, Erma, B. S., 1916; Assistant Chemist Montana Experiment Station, Bozeman, Montana.

Lewis, Edna, B. S., 1903; Instructor in Mathematics, Gallatin County High School, and Member of County Board of Examiners, Bozeman, Montana.

Livingston, Walter B. S., 1910; Assistant Engineer, Malad Reservoir, Malad, Idaho.

Locke, Jerome G., B. C. E., 1908; C. E., 1910; President and General Manager of the Livingston Publishing Company, Livingston, Montana.

Lorentz, Floyd S., B. E. E., 1907; E. E., 1910; Electrician Anaconda Copper Mining Company, Great Falls, Montana.

Lott, Mortimer J., B. S., 1915; Farmer, Twin Bridges, Montana.

Luther, J. Glenn, B. S., 1912; Electrical Engineer, Conrey Placer Mining Company, Ruby, Montana.

Mackay, Warren, B. S., 1913; Draughtsman, Anaconda Copper Mining Company, Anaconda, Montana.

Malsor, Roy E., B. S., 1915; City Engineer's Office, Bozeman, Montana.

Martin, C. A., B. S., 1914; Civil Engineer, Great Northern Railway, Great Falls, Montana.

Maynard, Edna, B. S., 1900; M. S., 1903; Mrs. Garfield T. Morris, San Francisco, California.

Metheney, Blanche, B. S., 1911; Mrs. Ralph Kuschke, Billings, Montana.

Miewald, Ethel, B. S., 1916; Teacher of Domestic Science and English, Hysham, Montana.

Milburn, George R., B. S., 1916; Real Estate Business, Miles City, Montana.

Millegan, Homer D., B. S., 1914; Farmer and Stockgrower, Millegan, Montana.

Millegan, Guy J., B. S., 1912; Farmer and Stockgrower, Millegan, Montana.

Monforton, Zoe, B. S., 1901; Mrs. H. C. Patterson, National City, California.

Moore, Ellie J., B. S., 1901; Farmer and Insurance, Bozeman, Montana.

Morgan, Carl F., B. S., 1915; Farmer, Joliet, Montana.

Morgan, George W., B. S., 1912; United States Experiment Farm, Havre, Montana.

Morgan, Joseph D., B. S., 1912; Assistant Grain Standardization Bureau, United States Department of Agriculture, New Orleans, La.

Morgan, Oliver P., B. S., 1896; Deceased.

Morris, Harry Elwood, B. S., 1909; Graduate Student, University of Wisconsin, Madison, Wis.

Morris, Garfield T., B. C. E., 1903; Senior Civil Engineer in the Valuation Department, Interstate Commerce Commission, Pacific Division, San Francisco, California.

Mountjoy, Agnes, B. S., 1907; Mrs. Harry Mickelson, Opheim, Montana.

Mountjoy, Irvin, B. E. E., 1908; Homesteader, Cardwell, Montana.

Myers, Ada Mae, B. S., 1915; Mrs. Jay Jacobs, Billings, Montana.

McCormick, C. C., B. S., 1916; Instructor in Agriculture, Billings Polytechnic Institute, Billings, Montana.

McCraw, John L., B. S., 1912; Deceased.

Nash, Lewis, B. S., 1904; Farmer, Clyde Park, Montana.

Noble, Edward G., B. S., 1915; Scientific Assistant, United States Department of Agriculture, Huntley, Montana.

Noble, Erma, B. S., 1909; M. S., 1910; Bozeman, Montana.

O'Connor, William, B. S., 1916; Farmer, Red Lodge, Montana.

Osborne, Belle, B. S., 1907; Mrs. D. E. Fish, Mount Pleasant, Iowa.

Osenberg, Albert, B. S., 1916; Agronomy Department United States Department of Agriculture, Washington, D. C.

Papke, William C., B. S., 1915; Farmer, Bozeman, Montana.

Pease, Jay L., B. S., 1907; Farmer, Bozeman, Montana.

Peck, Harry L., B. S., 1911; Electrical Engineer, Milwaukee Electrical Department, Butte, Montana.

Penwell, Clyde C., B. S., 1906; B. E. E., 1907; Montana Power Company, Great Falls, Montana.

Penwell, Clyde W., B. E. E., 1909; Montana Power Company, Great Falls, Montana.

Peters Orville S., P. S., 1909; E. E., 1912; Assistant Physicist Bureau of Standards, Washington, D. C.

Peterson, James A., B. S., 1909; St. Paul Daily News, St. Paul, Minn.

Pettigrew, Leslie R., B. S., 1915; United States Forest Produce Laboratory, Madison, Wisconsin.

Philpott, June, B. S., 1911; Head of Mathematics Department, Corvallis High School, Corvallis, Oregon.

Piedalue, Aimee M., B. S., 1915; Bozeman, Montana.

Piedalue, Irene M., B. S., 1911; Visiting Housekeeper, Houston Social Service Bureau, Houston, Texas.

Piedalue, Laura, P. S., 1912; Instructor in Home Economics, Helena High School, Helena, Montana.

Pool Florence E., B. S., 1915; Instructor in Home Economics, Havre High School, Havre, Montana.

Pool, Louis K., B. S., 1910; City Engineer, Townsend, Montana.

Potter, Ermine L., B. S., 1906; Professor Animal Husbandry, Oregon Agricultural College, Corvallis, Oregon.

Potter, John V., B. S., 1915; Electrical Engineer, Westinghouse Electric Company, Springfield, Massachusetts.

Quaw, Eugene, B. S., 1911; Playwright, Bozeman, Montana.

Quaw, Lucille, B. S., 1903; Teacher, Bozeman, Montana.

Quaw, Mignon, B. S., 1902; Instructor in English, Montana State College, Bozeman, Montana.

Quaw, Thomas, B. S., 1907; Mercantile Business, Bozeman, Montana.

Reese, Herbert J., B. S., 1904; Chemist, Los Angeles, California.

Riddell, Marsa, P. S., 1916; Instructor in Home Economics, Butte High School, Butte, Montana.

Robinson, J. W., B. S., 1908; Grain Buyer for McCaull-Dinsmore Company, Minneapolis, Minnesota.

Roecher, Rausie, B. S., 1914; Mrs. Selmer Solberg, Big Timber, Montana.

Romney, G. O., B. S., 1916; Instructor in English and Athletics, Billings High School, Billings, Montana.

Sacket, Nathalie, B. S., 1913; Teacher, Harlowton High School, Harlowton, Montana.

Sacket, Charles T., B. C. E., 1904; C. E., 1907; Consulting Civil Engineer, Livingston, Montana.

Sales, Reno H., B. S., 1898; Geologist, Anaconda Copper Mining Company, Butte, Montana.

Schabarker, W. W., B. M. E., 1902; Night Foreman, Shops, Milwaukee, Railroad, Milwaukee, Wisconsin.

Schmidt, F. W., B. S., 1903; Mining Engineer, Sao Paulo, Brazil, S. A.

Schumacher, F. W., B. S., 1914; United States Forestry Service, Deer Lodge, Montana.

Seamans, Arthur, B. S., 1913; United States Government Experiment Service, Huntley, Montana.

Seamans, Howard L., B. S., 1916; Assistant in Entomology and Zoology, Montana State College, Bozeman, Montana.

Shaw, W. T., B. S., 1896; Unknown.

Shovell, William L., B. S., 1912; Horticultural Expert, Bitter Root Irrigation Company, Hamilton, Montana.

Sloan, J. Harvey, B. C. E., 1903; Public Service Commisison, Madison, Wisconsin.

Sloan, W. F., B. E. E., 1903; Consulting Engineer, Madison, Wisconsin.

Sloan, William Glenn., B. S., 1910; Government Drainage Engineer, Boise, Idaho.

Smith, Alda, B. S., 1913; Mrs. Harold Clay, Charlotte, Michigan.

Smith, Inez., B. S., 1916; Instructor in Home Economics, Gallatin County High School, Bozeman, Montana.

Snider, Leta, B. S., 1911; Mrs. James A. Peterson, St. Paul, Minnesota.

Solberg, Selmer H., B. S., 1914; In Business, Big Timber, Montana.

Soper, Joseph, B. S., 1913; Fruit Inspector, San Diego, California.

Spain, J. Marvin, B. S., 1911; Homesteader, Edwards, Montana.

Spain, Whitfield, B. S., 1909; Manager of ranch, Belgrade, Montana.

Spragg, Frank A., B. S. A., 1902; Plant Breeder of Farm Crops for the Michigan Experiment Station, Lansing, Michigan.

Stadler, Marie, B. S., 1916; Graduate Student in Chemistry, Columbia University, New York City.

Stafford, Lucy B., B. S., 1896; Mrs. William Peck, Pony, Montana.

Stanley, Amelia, B. S., 1916; Assistant in Home Economics, Great Falls High School, Great Falls, Montana.

Steel, David, B. S., 1916; Inspector for G. N. R. R., Harlem, Montana.

Steel, Hamilton, B. S., 1915; Deceased.

Sweat, Ruth, B. S., 1916; Teacher of Home Economics, Raynsford, Montana.

Switzer, Madge, B. S., 1914; Teacher of Cooking, Gallatin County High School, Bozeman, Montana.

Tavener, Frank, B. C. E., 1903; Consulting Engineer, Missoula, Montana.

Taylor, Emma, B. S., 1915; Instructor in Home Economics, Belgrade Schools, Belgrade, Montana.

Taylor, John C., B. S., 1912; Farmer and Stockman, Chinook, Montana.

Thompson, A. Paul, B. S., 1915; First Assistant Chemist Electrolytic Zinc Plant, Great Falls, Reduction Works, Anaconda Copper Mining Company, Great Falls, Montana.

Thompson, Homer C., B. S., 1902; President Three Valleys Cooperative Association, Three Forks, Montana.

Thorpe, Elizabeth, B. S., 1907; Graduate Student Teachers' College, Columbia University, New York City.

Thorpe, Mabel A., B. S., 1907; Mrs. J. A. Thaler, Bozeman, Montana.

Tracy, Edna B., B. S., 1908; Mrs. John White, Bozeman, Montana.

Tremper, William G., B. S., 1911; Homesteader, Baylor, Montana.

Truitt, Alonzo C., B. S., 1915; Civil Engineer for Burns and McDonnell, Kansas City, Missouri.

Trumann, Joseph K., B. S., 1913; Electrical Engineer, Montana Power Company, Canyon Ferry, Montana.

Vestal, William B., B. S., 1914; City Engineer, Anaconda, Montana.

Vreeland, Edna, B. S., 1909; Mrs. Robert K. Plues, Los Angeles, California.

Wade, Arthur M., B. S., 1911; Milwaukee Railroad, Three Forks, Montana.

Walchli, Fred, B. S., 1910; Mechanical Engineer, Kalispell, Montana.

Walker, Cecil, B. S., 1916; Instructor in Home Economics, Anacortes, Washington.

Webster, Alden, B. S., 1914; Electrical Draftsman, Corps of Engineers, United States Army, Washington, D. C.

Wharton, John C., B. S., 1913; Stock Business, Wisdom, Montana.

Widener, Carl C., B. S., 1908; City Engineer, Bozeman, Montana.

Wilcomb, Maxwell J., B. S., 1915; Civil Engineer, Clearmont, Wyoming.

Willey, Leroy, B. S., 1913; Dry Land Office, United States Department of Agriculture, Sheridan, Wyoming.

Williams, Frank B., B. M. E., 1899; Engineer, State School for Deaf and Blind, Boulder, Montana.

Williams, Roy B., B. S., 1911; Civil Engineer, Power, Montana.

Williams, Sidney A., B. S., 1911; Electrical Engineer, H. J. Heinz Company, Pittsburg, Pa.

Williams, Lee, B. E. E., 1902; County Surveyor, Powell County and City Engineer, Deer Lodge, Montana.

Wilson, Walter G., B. S., 1913; Westinghouse Electrical and Manufacturing Co., Los Angeles, California.

Wilson, Elva, B. S., 1909; Mrs. N. P. Nelson, Three Forks, Montana.

Wilson, Kathleen, B. S., 1915; Instructor in Home Economics, Harlowton High School, Harlowton, Montana.

Wolpert, Harold E., B. S., 1912; Working in Smelter, Mullen, Idaho.

Wylie, Lawrence, B. S., 1913; Electrification Department, C. M. & St. P. R. R., Butte, Montana.

Wylie, Mary, B. S., 1910; Bozeman, Montana.

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PUBLICATIONS of THE UNIVERSITY of MONTANA

Copies of the several series of the University of Montana Bulletin, of the University of Montana Circular, and of the University of Montana Syllabi, may be obtained upon request from the President of the particular institution concerned. Copies of the University of Montana Studies and of the General Series of the Bulletin and of the Circular will be furnished from the office of the Chancellor of the University.

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Each series of the Bulletin is issued quarterly, and contains annual reports, catalogues, etc.

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3. College of Agriculture and Mechanic Arts Series.
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5. Normal College Series.
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Each series of the Circular is issued at irregular intervals and contains various special announcements.

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Issued quarterly, and contains the contributions resulting from the investigation and research in the several departments and divisions of the University excepting those of the Agricultural Experiment Station, which are issued in the Bulletin.

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Each series contains outlines and Syllabi of certain courses of instruction given at the several institutions.

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APPLIED SCIENCE, HOUSEHOLD AND INDUSTRIAL ARTS,
COURSES IN VOCATIONAL EDUCATION,
SECONDARY SCHOOLS OF AGRICULTURE,
HOME ECONOMICS, MECHANIC ARTS

TWENTY-FIFTH ANNUAL CATALOGUE

1917-1918

ANNOUNCEMENTS FOR
1918-1919

BOZEMAN, MONTANA
MAY, 1918

Entered at Bozeman, Montana, as Second Class Matter Under Act of Congress
August 24, 1912.

THE UNIVERSITY OF MONTANA

EDWARD C. ELLIOTT, Chancellor of the University.

The University of Montana is constituted under the provisions of Chapter 92 of the Laws of the Thirteenth Legislative Assembly, Approved March 14, 1913, (effective July 1, 1913).

The general control and supervision of the University are vested in the State Board of Education. The Chancellor of the University is the chief executive officer. For each of the component institutions there is a local executive board.

Montana State Board of Education

S. V. STEWART, Governor.....Ex-officio, President
S. C. FORD, Attorney General.....Ex-officio
MAY TRUMPER, Supt. of Public Instruction.....Ex-officio, Secretary

C. H. HALL	(1918)	W. S. HARTMAN	(1920)
J. BRUCE KREMER	(1918)	C. E. K. VIDAL	(1920)
LEO H. FAUST	(1919)	JOHN DIETRICH	(1921)
W. H. NYE	(1919)	A. LOUIS STONE	(1921)

The University comprises the following institutions, schools and departments:

The State University, Missoula

Established February 17, 1893, and consisting of

The College of Arts and Sciences
The School of Law
The School of Pharmacy
The School of Forestry
The School of Journalism
The School of Music
The Summer Quarter
The Biological Station (Flathead Lake)
The Public Service Division
Special War Courses
- Military Service Course (1 yr.)
- Nurses' Preparatory Course (1 yr.)
- Office Training Course (1 yr.)

The Graduate Division.

EDWARD O. SISSON, President.

The State College of Agriculture and Mechanic Arts, Bozeman

Established February 16, 1893, and consisting of

The College of Agriculture
The College of Engineering
The College of Applied Science
The College of Household and Industrial Arts
Courses in Vocational Education
The School of Music
The Summer Quarter
The Agricultural Experiment Station
The Agricultural Extension Service
The Secondary Schools
- Home Economics
- Mechanic Arts
- Agriculture

Special War Courses
- Military Service Course (1 yr.)
- Nurses' Preparatory Course (1 yr.)
- Office Training Course (1 yr.)

JAMES M. HAMILTON, President.

The State School of Mines, Butte

Established February 17, 1893.

CHARLES H. BOWMAN, President.

The State Normal College, Dillon

Established February 23, 1893, and consisting of

The Teachers' Certificate Course
The Three-years Course
The Four-years Course
The Rural Teachers' Course
The Course for Supervisors

JOSEPH E. MONROE, President.

For publications and detailed information concerning the different schools and colleges address the President of the particular institution concerned. Communications intended for the Chancellor of the University should be addressed to the State Capitol, Helena, Montana.

UNIVERSITY OF MONTANA BULLETIN

STATE COLLEGE SERIES NO. 9

STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS

COLLEGES OF AGRICULTURE, ENGINEERING,
APPLIED SCIENCE, HOUSEHOLD AND INDUSTRIAL ARTS,
COURSES IN VOCATIONAL EDUCATION,
SECONDARY SCHOOLS OF AGRICULTURE,
HOME ECONOMICS, MECHANIC ARTS

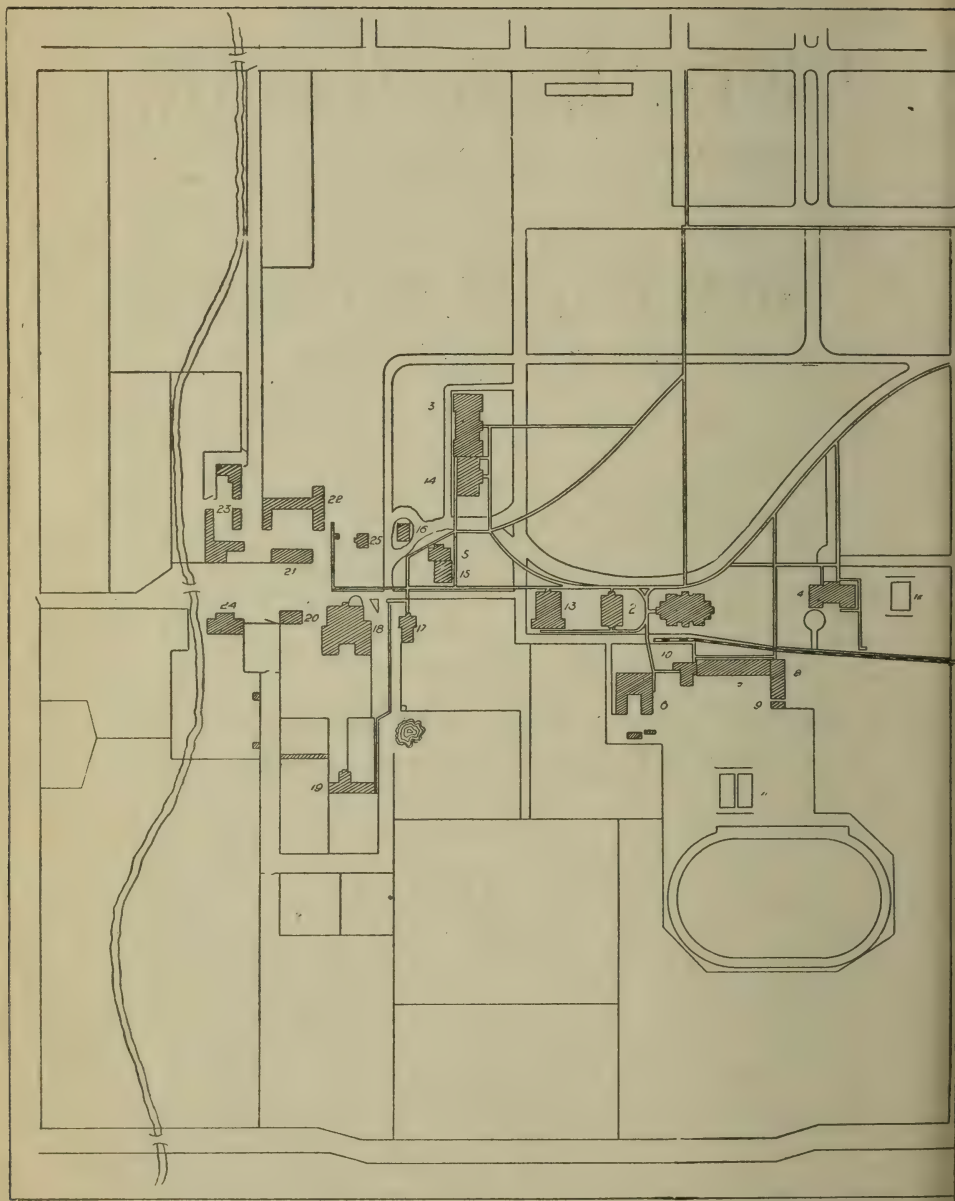
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Entered at Bozeman, Montana, as Second Class Matter Under Act of Congress
August 24, 1912.



1. Montana Hall.
2. Chemistry Building. (Destroyed by fire Oct. 20, 1916.)
3. Agricultural Hall.
4. Hamilton Hall.
5. Biology Building.
6. Shops.
7. Engineering Laboratory.
8. Electrical Engineering Lab.
9. Cement Laboratory.
10. Heating Plant.
11. Tennis Courts.
12. Tennis Court for Women.
13. Gymnasium and Drill Hall.
14. Horticultural Greenhouse.
15. Biological Greenhouse.
16. Lower Heating Plant.
17. Veterinary Building.
18. Cattle Barn.
19. Poultry Houses.
20. Granary.
21. Horse Barn.
22. Implement Sheds.
23. Sheep Barn and Piggery
24. Feeding Barn.
25. Club House.

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1918

JANUARY

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1920

JANUARY

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APRIL

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				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

MAY

S	M	T	W	T	F	S
						1
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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

JUNE

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

JULY

S	M	T	W	T	F	S
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11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

AUGUST

S	M	T	W	T	F	S
1	2	3	4	5	6	7
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15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

SEPTEMBER.

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

OCTOBER

S	M	T	W	T	F	S
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3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

NOVEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

DECEMBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Calendar.

1918-1919

Until the end of the academic year 1916-17 the calendars of the State University and the State College of Agriculture and Mechanic Arts had provided for two semesters of eighteen weeks each, followed by a six weeks summer session. At the State Normal College, however, the four quarters plan has been in operation beginning with the year 1911-12.

In pursuance of the suggestion of the Council of National Defense for economy of time of students and maximum utilization of the resources of higher educational institutions, the calendars of the State University and the State College of Agriculture and Mechanic Arts were reorganized, beginning October 1st, 1917, on the basis of a year made up of four quarters of approximately twelve weeks each. This adjustment enables students whose work is interrupted by emergencies to resume attendance whenever they are free, and will make it possible for those who are able to continue in attendance throughout four quarters to complete their courses at an earlier date than under the former plan.

In adapting the program of courses to the four quarters calendar, changes have been made which tend to concentrate a student's time and energy on fewer subjects during any one quarter. Also a longer period of instruction is afforded during the summer,— the season when school teachers can most readily avail themselves of the opportunities for study.

1918 **Spring Quarter.**

Mar. 25, Monday	Instruction begins.
May 30, Thursday	Memorial Day, a Holiday*
June 9, Sunday	Baccalaureate Address
June 12, Wednesday	Commencement
June 12-14, Wednesday-Friday	Examinations

Summer Quarter

June 17, Monday	First Term begins
July 4, Thursday	Independence Day, a Holiday*
July 26, Friday	First Term ends
July 29, Monday	Second Term begins
Aug. 30, Friday	Second Term ends

Autumn Quarter

Sept. 27, 28, Friday, Saturday	Registration Days
Sept. 30, Monday	Instruction begins

Oct. 12, Saturday.....Columbus Day*
Nov. 8, Friday.....Standing of Students Reported
Nov. 28, Thursday.....Thanksgiving Day, a Holiday*
Dec. 18-20, Wednesday-Friday.....Examinations
Dec. 20, Friday.....Registration for Second Quarter
Dec. 20, Friday, 4:30 p. m.....First Quarter ends, Christmas Recess begins

1919 Winter Quarter

Jan. 4, Saturday.....Registration of New Students
Jan. 6, Monday.....Christmas Recess ends, Instruction begins.
Feb. 12, Wednesday.....Lincoln's Birthday *
Feb. 14, Friday.....Standing of Students Reported
Feb. 16, Sunday.....Founders' Day *
Feb. 22, Saturday.....Washington's Birthday *
Mar. 5-8, Wednesday-Saturday.....Interscholastic Basketball Tournament.
Mar. 26-28, Wednesday-Friday.....Examinations

Spring Quarter

Mar. 29, Saturday.....Registration Day
Mar. 31, Monday.....Instruction begins
May 9, Friday.....Standing of Students Reported
May 30, Friday.....Memorial Day, a Holiday*
June 15, Sunday.....Baccalaureate Address
June 18, Wednesday.....Commencement
June 18-20, Wednesday-Friday.....Examinations

Summer Quarter

June 23, Monday.....First Term begins
July 4, Friday.....Independence Day, a Holiday*
Aug. 1, Friday.....First Term ends
Aug. 4, Monday.....Second Term begins
Sept. 5, Friday.....Second Term ends

Autumn Quarter

Sept. 26, 27, Friday, Saturday.....Registration Days
Sept. 29, Monday.....Instruction begins
Oct. 12, Sunday.....Columbus Day *
Nov. 27, Thursday.....Thanksgiving Day, a Holiday*
Dec. 17-19, Wednesday-Friday.....Examinations
Dec. 19, Friday, 4:30 p. m.....First Quarter ends, Christmas Recess begins.

*No days are holidays unless specially designated as such in the calendar.

Official Directory

EXECUTIVE BOARD

JAMES M. HAMILTON (ex-officio), Chairman.....Bozeman

By Appointment

J. H. BAKER.....Bozeman
(Term Expires April, 1919.)

W. S. DAVIDSON.....Bozeman
(Term Expires April 1921)

H. J. GREENE, Secretary-Treasurer.....Bozeman

ADMINISTRATIVE OFFICERS.

EDWARD C. ELLIOTT, Ph. D.....Chancellor, University of Montana
JAMES M. HAMILTON, M. S.....President
FREDERICK B. LINFIELD, B. S. A.....Director, Experiment Station
FRED S. COOLEY, B. S.....Director, Extension Service
UNA B. HERRICK.....Dean of Women
JOHN H. HOLST.....Principal, Secondary Schools and Director, Summer Session.
R. ORVIS WILSON, B. S.....Registrar
OLIVE CLARK, B. S.,.....House Director at Hamilton Hall
JOHN C. PARK.....Superintendent of Buildings

THE FACULTY.

Professors.

ABBEY, M. J., A. B., (Brown University)
Director of Vocational Education and
Professor of Agricultural Education.

*ARNETT, CLARE NEWTON, B. S. A. (Purdue University)
Professor of Animal Husbandry.

†ATKINSON, ALFRED, B. S. (Iowa State College)
M. S. (Cornell University)
Professor of Agronomy.

BENNION, FRED, A. B. (University of Utah)
Physical and Athletic Director.

‡BREWER, WILLIAM F., A. B. (Grinnell College)
A. M. (Grinnell College)
A. M. (Harvard University)
Professor of English.

*On leave of absence—In Red Cross service in France.
†On leave of absence—Federal Food Administrator for Montana.
‡On leave of absence—In Y. M. C. A. War Work.

CLARK, HOLLIS C., (West Point, Captain United States Army)
Professor of Military Science and Tactics.

COBLEIGH, WILLIAM M., E. M. (College of Montana)
A. M. (Columbia University)
Professor of Chemistry.

CONKLING, LEON D., C. E. (Cornell University)
Professor of Civil Engineering.

COOLEY, ROBERT A., B. S. (Massachusetts Agricultural College.)
Professor of Entomology and Zoology.

CURRIER, AARON H., A. B. (Oberlin College)
A. M. (Oberlin College)
Director of the School of Music and Professor of Vocal Music.

FORREST, ELIZABETH, B. L. S. (University of Illinois)
A. M., (University of Chicago)
Librarian.

HAM, FRANK, B. S. (Montana State College)
M. S. (Montana State College)
Professor of Physics.

HAMILTON, JAMES M., B. S. (Union Christian College)
M. S. (Union Christian College)
President and Professor of Economics and Sociology.

HARKINS, LILLA A., B.S. (South Dakota State College)
M. S. (South Dakota State College)
Professor of Home Economics.

HERRICK, UNA B.
Dean of Women and Director of Physical Education for Women.

HOLST, JOHN H.
Principal of the Secondary Schools, Director of the Summer Session, and Assistant Professor of English.

LINFIELD, FREDERICK B., B. S. A. (Ontario Agricultural College)
Dean of Agriculture.

MARTIN, GEORGE LESTER, B. S. (Iowa State College)
Professor of Dairy Husbandry.

NASH, W. GIFFORD
Professor of Piano Music.

PLEW, WILLIAM R., B. S. (Rose Polytechnic Institute)
M. S. (Rose Polytechnic Institute)
Professor of Architectural and Civil Engineering.

RICHTER, ARTHUR W., B. M. E. (University of Wisconsin)
M. E. (University of Wisconsin)
M. M. E. (Cornell University)
Dean of Engineering and Professor of Mechanical Engineering.

SCHOPPE, WILLIAM F., B. S. (University of Maine)
M. S. (University of Maine)
Professor of Poultry Husbandry.

SWINGLE, DEANE B., B. S. (Kansas State Agricultural College)
M. S. (University of Wisconsin)
Professor of Botany and Bacteriology.

TALLMAN, WILLIAM D., B. S. (University of Wisconsin)
Professor of Mathematics.

THALER, JOSEPH A., E. E. (University of Minnesota)
Professor of Electrical Engineering.

WELCH, HOWARD, A. B. (University of Missouri)
B. S. A. (University of Missouri)
D. V. M. (Cornell University)
Professor of Veterinary Science.

WHIPPLE, ORVILLE B., B. S. (Kansas State Agricultural College)
Professor of Horticulture.

WILSON, R. ORVIS, B. S. (South Dakota State College).
Professor of Secretarial Studies and Registrar.

Assistant Professors.

BALDWIN, LANA A.
Assistant Professor of Art.

BALLINGER, FLORENCE
Assistant Professor of Domestic Art.

*BOGUE, ROBERT H., B. S. (Tufts College)
M. S. (Massachusetts Agricultural College)
Assistant Professor of Chemistry.

BREWER, HELEN R., A. B. (Grinnell College)
Assistant Professor of History.

CEHRS, CARRIE M., A. B. (University of Denver)
A. M. (University of Denver)
Assistant Professor of German.

CHALLENDER, RALPH T., B. S. (Kansas State Agricultural College)
Assistant Professor in Trades and Industry.

*Resigned December 1, 1917.

CURRIER, EDWIN L., B. S. (University of Nebraska)
Assistant Professor of Farm Management.

DUDDY, EDWARD A., A. B. (Bowdoin College)
A. M. (Harvard University)
Assistant Professor of English.

FORD, CARLOTTA MARKS, A. B. (University of Illinois)
Assistant Professor of Home Economics.

GIESEKER, LEONARD F., B. S. (University of Nebraska)
M. S. (Cornell University)
Assistant Professor of Agronomy.

JENNISON, HARRY M., B. S. (Massachusetts Agricultural College)
M. A. (Wabash College)
Assistant Professor of Botany and Bacteriology.

JOSEPH, W. E., B. S. (Purdue University)
Ph. D. (University of Illinois)
Assistant Professor of Animal Husbandry.

LIVINGSTON, ALFRED, B. S. (University of Chicago)
A. M. (University of Chicago)
Assistant Professor of Vocational Education.

MURDOCK, HARVEY E., B. S. (University of Colorado)
M. E. (University of Colorado)
C. E. (University of Colorado)
Assistant Professor of Farm Mechanics.

MCCHORD, R. C., A. B. (Central University)
B. S. A. (Iowa State College)
Assistant Professor of Animal Husbandry.

SNOW, FRANK C., C. E. (Ohio State University)
Assistant Professor of Civil Engineering.

SPAULDING, MILO HERRICK, A. B. (Leland Stanford Junior University)
A. M. (Leland Stanford Junior University)
Assistant Professor of Zoology.

STARRING, CECIL C., B. S. (South Dakota State College)
Assistant Professor of Horticulture.

WHITCOMB, WILLIAM O., B. S. A. (North Dakota Agricultural College)
M. S. A. (Cornell University)
Assistant Professor of Agronomy.

WOHLENBERG, WALTER J., B. S. (University of Nebraska)
M. S. (University of Illinois)
Assistant Professor of Mechanical Engineering.

INSTRUCTORS

BRENEMAN, ANNIE T., B. S. (Montana State College)
Instructor in Mathematics.

†BULL, FRIEDA M., B. S. (Montana State College)
M. S. (Montana State College)
Instructor in Mathematics.

CUBINE, GEORGIA, A. B. (Kansas State University)
Instructor in English

DONALDSON, JESSIE, A. B. (University of Minnesota)
Instructor in English.

HARTMAN, JUNE, B. S. (Montana State College)
Instructor in Piano Music.

HOMANN, FREDERICK C., B. S. (Montana State College)
Instructor in Mechanical Engineering.

HOWARD, LOUIS L.
Instructor in Band Music.

HYTREE, EDWARD C., B. S. (Ohio Wesleyan University)
A. M. (Ohio State University)
Instructor in Chemistry.

JACKSON, FRED O.
Instructor in Violin and Orchestra.

JONES, THEDA M.
Instructor in Stenography and Typewriting.

KATELEY, FRED
Instructor in Forge and Foundry.

KIEFER, JAMES A., B. S. (Montana State College)
Instructor in Physics.

LIBBY, RALPH, B. S. (Dartmouth College)
M. C. S. (Amos Tuck School of Administration and Finance, Dartmouth College)
Instructor in Secretarial Studies.

MAXWELL, LORA, B. Pd. (Montana State Normal College)
Instructor in Physical Education.

MILLER, F. CLIFFORD, B. S. (James Millikin University)
Instructor in Mechanical Engineering.

MOORE, MURIEL
Instructor in Art.

†On leave of absence.

OSTERHOLM, LISA, B. S. (Columbia University)
A. M. (Columbia University)
Instructor in Home Economics.

‡POWELL, GREGORY S., A. B. (University of Montana)
Instructor in Economics.

*QUAW, MIGNON M., B. S. (Montana State College)
A. M. (Columbia University)
Instructor in English.

†SLOAN, ROYAL D., B. S. (University of Montana)
Instructor in Electrical Engineering.

TRETSVEN, OSCAR
Instructor in Animal Husbandry.

WALLIN, FLORENCE, A. B., (State University of Iowa)
Instructor in French and Spanish.

Assistants.

LUND, JANELLE, B. S. (Montana State College)
Assistant in Chemistry.

PARK, JOHN C.
Assistant in Engineering.

STRAND, A. LEROY, B. S., (Montana State College)
Assistant in Entomology.

TRUMAN, IDA, B. S. (Montana State College)
Assistant in Home Economics.

EXPERIMENT STATION STAFF.

LINFIELD, FREDERICK B., B. S. A. (Ontario Agricultural College)
Director.

Department Heads

| ARNETT, CLARE NEWTON, B. S. A. (Purdue University)
Animal Husbandry.

*On leave of absence.
†On leave of absence—In U. S. Navy.
‡On leave of absence—In U. S. Army.
|On leave of absence—In Red Cross Service in France.

§Atkinson, Alfred, B. S., (Iowa State College)
M. S. (Cornell University)
Agronomy.

Burke, Edmund, B. S. (Montana State College)
Chemistry and Meteorology.

Cooley, Robert A., B. S. (Massachusetts Agricultural College)
Entomology.

Currier, Edwin L., B. S. (University of Nebraska)
Farm Management.

Jahnke, E. W., B. S. (University of Minnesota)
Superintendent of Grain Laboratory.

Murdock, Harvey E., B. S. (University of Colorado)
M. E. (University of Colorado)
C. E. (University of Colorado)
Agricultural Engineer.

Schoppe, William F., B. S. (University of Maine)
M. S. (University of Maine)
Poultry.

Swingle, Deane B., B. S. (Kansas State Agricultural College)
M. S. (University of Wisconsin)
Botany and Bacteriology.

Welch, Howard, A. B. (University of Missouri)
B. S. A. (University of Missouri)
D. V. M. (Cornell University)
Veterinary.

Whipple, Orville B., B. S. (Kansas State Agricultural College)
Horticulture.

Department Assistants.

†Blish, Morris J., B. S. (University of Nebraska)
A. M. (University of Nebraska)
Ph. D. (University of Minnesota)
Chemistry.

Gieseker, Leonard F., B. S. (University of Nebraska).
M. S. A. (Cornell University)
Agronomy.

†Jones, Ray S., B. S. (Montana State College)
Chemistry.

§On leave of absence—Federal Food Administrator for Montana.
†On leave of Absence—In U. S. Army.

JOSEPH, W. E., B. S. (Purdue University)
Ph. D. (University of Illinois)
Animal Husbandry.

‡MORRIS, ERNEST
Agronomy.

MORRIS, H. E., B. S. (Montana State College)
Botany and Bacteriology.

NELSON, JOSEPH B.
Agronomy.

PARKER, JOHN R., B. S. (Massachusetts Agricultural College)
Entomology.

PINCKNEY, REUBEN M., B. S. (Nebraska Wesleyan University)
A. M. (University of Nebraska)
Chemistry.

QUINN, E. J., B. S. (Notre Dame University)
Chemistry.

STARRING, CECIL C., B. S. (South Dakota State College)
Horticulture.

TRETSVEN, OSCAR
Animal Husbandry.

SUBSTATION STAFF.

Judith Basin Substation, Moccasin.

STEPHENS, JOHN M.
Superintendent.

DONALDSON, NOBLE C., B. S. (Montana State College)
Assistant.

MOOMAW, LEROY, B. S. (Missouri State University)
Assistant.

North Montana Substation, Havre

MORGAN, GEORGE, B. S. (Montana State College)
Superintendent.

Huntley Substation, Huntley

HANSEN, DAN
Superintendent.

‡On leave of absence—In Hospital Corps.

NOBLE, EDWARD, B. S. (Montana State College)
Assistant.

SEAMANS, ARTHUR, B. S., (Montana State College)
Assistant.

Horticultural Substation, Corvallis

THORNBER, HARVEY, B. S. (Washington State College)
Superintendent.

AGRICULTURAL EXTENSION STAFF.

COOLEY, FRED S., B. S. (Massachussets Agricultural College)
Director.

ABBEY, M. J., A. B. (Brown University)
Leader of Boys' and Girls' Clubs.

BEERS, WAYLAND L., B. A. (Brown University)
Market Specialist.

BENNION, FRED, A. B. (University of Utah)
M. S. (University of Pennsylvania)
Assistant County Agent Leader.

HARTMAN, WILLIAM J., B. S. A. (Ontario Agricultural College)
D. V. M. (Chicago Veterinary College)
Livestock Specialist.

LOTT, ELMO HAMILTON, B. S. (Cornell University)
B. S. A. (Iowa State College)
Assistant County Agent Leader.

OGILVIE, MINA, M. S. (Iowa State College)
Home Economics Specialist.

POTTER, C. E.
Assistant Club Leader.

QUAW, MIGNON M., B. S. (Montana State College)
M. A. (Columbia University)
Assistant State Leader of Home Demonstration Agents.

ROWE, BESS M., B. S. (University of Minnesota)
State Leader of Home Demonstration Agents.

TAYLOR, JOHN C., B. S. (Montana State College)
Assistant County Agent Leader.

TOMSON, W. E., B. S. (Kansas Agricultural College)
Field Agent in Dairying.

WILSON, MILBURN LINCOLN, B. S. A., (Iowa State College)
State Leader of County Agents.

COUNTY AGENTS

ANDERSON, A. D., (Minnesota School of Agriculture)
Richland County, Sidney.

ANDERSON, E. W., B. S. A. (North Dakota Agricultural College)
Sheridan County, Havre.

BANKER, PAUL P., B. S. (University of Wisconsin)
Hill County, Havre.

BROICH, WALTER F., B. S. A. (Oklahoma A. & M. College)
M. S. (Oregon Agricultural College)
Rosebud County, Forsyth.

BUSH, C. A., (University of Minnesota)
Flathead County, Kalispell.

CAMPBELL, J. R., B. S. (Iowa State College)
M. S. (Iowa State College)
Missoula County, Missoula.

CLARKSON, ROBERT E., B. S. (Montana State College)
Phillips County, Malta.

FULLER, F. E., B. S. A. (Kansas Agricultural College)
B. S. A. (Iowa State College)
County Agent at Large.

GORDON, W. R., B. S. A. (West Virginia University)
Broadwater County, Townsend.

HAMPTON, SAMUEL
Western Dawson County, Sumatra.

HILLMAN, FRANK M., B. S. (University of Minnesota)
Sanders County, Thompson Falls.

JONES, W. H., B. S. A. (West Virginia University)
Stillwater County, Columbus.

MACSPADDEN, F. E., B. S. (Montana State College)
Cascade County, Great Falls.

MENDENHALL, DEANE W., B. S. A. (North Dakota Agricultural College)
Dawson County, Glendive.

MICHELS, CHARLES W., B. S. A. (North Dakota Agricultural College)
M. S. (University of Wisconsin)
Toole County, Shelby.

MURDOCK, WALLACE S., B. S. (Utah Agricultural College)
Teton County, Choteau.

PETERSON, CARL H., (Minnesota School of Agriculture)
Fergus County, Lewistown.

SCOTT, ROY S., B. S. A. (University of Illinois)
Musselshell County, Roundup.

SHINN, W. R., B. S. A. (University of Illinois)
Chouteau County, Fort Benton.

SKUSE, W. W., B. S. (Washington State College)
C. E. (Washington State College)
Lewis and Clark County, Helena.

SPRING, L. H., B. S. A. (Oregon Agricultural College)
Ravalli, Granite, and Powell Counties, Hamilton.

STAPLETON, W. P., B. S. A. (North Dakota Agricultural College)
District Agent.

STEBBINS, MURRAY E., B. S. (North Dakota Agricultural College)
Valley County, Glasgow.

THORFINNSON, M. A., B. S. A. (North Dakota Agricultural College)
Blaine County, Chinook.

YERRINGTON, C. M., B. S. (North Dakota Agricultural College)
Custer County, Miles City.

Assistant County Agents

ROBERTS, OTTO P.
Sheridan County, Plentywood.

ROSS, THOMAS A., B. S. (Montana State College) to be conferred 1918.
Hill County, Havre.

Home Demonstration Agents

BARNARD, E. MARIE, B. S. (Kansas State Agricultural College)
Yellowstone District.

BETZ, NEVEN O., B. A. (University of Wisconsin)
City of Great Falls.

BUSH, CLARA A., B. S. (University of Minnesota)
Missoula County.

KELLEY, JEANETTE A., B. S. (Montana State College)
Stillwater County.

NEWELL, MARY
Fergus County.

OLSEN, ANTOINETTE, B. S. (University of Minnesota)
Sheridan County.

REYNOLDS, LUCILE W.
Lewis & Clark and Broadwater counties.

ROOSEVELT, GEORGIA C., B. S. (Montana State College)
Gallatin County.

WOOD, CHRISTINA M., B. S. (Washington State College)
Flathead County.

YOUNG, VERNA T., B. S. (Montana State College)
City of Butte.

SUMMER SESSION.

HOLST, JOHN H.
Director.

FACULTY.

ABBEY, M. J., A. B. (Brown University)
Agriculture and Rural Sociology

BRYAN, LILLIAN, M. E. L., (Howard Payne College)
History and Civics.

CHALLENDER, RALPH T., B. S. (Kansas State Agricultural College)
Manual Training.

COBLEIGH, WM. M., A. M. (Columbia University)
Chemistry

DAVIS, IDA M., A. B., (Central College)
Rural Arithmetic.

FORREST, DAISY
Playground

HAM, F. W., B. S. (Montana State College)
M. S. (Montana State College)
Physics.

HAMILTON, JAMES M., B. S. (Union Christian College)
M. S. (Union Christian College)
Psychology and History of Montana.

HARKINS, LILLA A., B. S. (South Dakota State College)
M. S. (South Dakota State College)
Home Economics.

HOLST, JOHN H.
Rural Education

.....
Music and Drawing.

KNOBEL, AMALIE
Primary Methods.

LIVINGSTON, ALFRED, B. S. (University of Chicago)
A. M. (University of Chicago)
Education.

LIBBY, J. RALPH, B. S. (Dartmouth College)
M. C. S. (Amos Tuck School of Administration and Finance, Dartmouth College)
Business Courses.

ROWE, BESS M., B. S. (University of Minnesota)
Food Demonstrations.

ROWE, MARY
Typewriting.

STARK, MADGE
Reading and Literature.

TALLMAN, W. D., B. S. (University of Wisconsin)
Mathematics.

WHIPPLE, O. B., B. S., (Kansas State Agricultural College)
Horticulture.

WHITCOMB, WILLIAM O., B. S. A. (North Dakota Agricultural College)
M. S. A., (Cornell University)
Soils and Crops.

WYLIE, MARY G., B. S., (Montana State College)
Hygiene and Sanitation.

YOUNG, VERNA T., B. S. (Montana State College)
Handicrafts.

SPECIAL LECTURERS.

EDWARD C. ELLIOTT,
Chancellor University of Montana.

MAY TRUMPER,
State Superintendent of Public Instruction of Montana.

E. O. SISSON,
President Montana State University.

ROBERT CLARK,
Professor of Psychology, State Normal College.

J. P. ROWE,
Professor of Geology, Montana State University.

CHARLES M. REINOEHL,
Inspector of Rural Schools.

ADELAIDE M. AYER,
Inspector of Rural Schools.

ALFRED ATKINSON,
Food Administrator for Montana.

J. E. MONROE,
President State Normal College.

Faculty Committees

ABSENCE:
Richter, Mrs. Herrick, Whipple.

ATHLETICS:
Swingle, Bennion, Tallman.

BUILDINGS AND GROUNDS:
Linfield, Fark, Whipple.

COMMENCEMENT:
Hamilton, Nash, Miss Baldwin.

ELIGIBILITY:
Hamilton, Schoppe, Wilson.

GRADUATE STUDIES:
Cooley, Martin, Thaler.

INTERSCHOLASTIC:
Bennion, Tallman, Duddy, Whipple, Kiefer, Wilson.

PUBLICATIONS:
Brewer, Plew, Cobleigh.

RECOMMENDATIONS FOR POSITIONS:
Wilson, Miss Harkins, Burke.

REGISTRATION:
Ham, Miss Brewer, Duddy.

SCHEDULE:
Tallman, McChord, Conkling.

SCHOLARSHIP:
Ham, Miss Cehrs, Martin.

STUDENT AFFAIRS:
Miss Brewer, Spaulding, Mrs. Herrick, Whitcomb, Miss Ballinger.

STUDENT LOAN:
Richter, Linfield, Mrs. Herrick.

University of Montana

HISTORICAL SKETCH

An Act of Congress approved February 18, 1881, dedicated for university purposes in Montana, seventy-two sections of the public domain. The Enabling Act, providing for the organization of the State of Montana and its admission to the Union, February 22, 1889, confirmed this grant to the State and added one-hundred thousand acres for a school of mines, one-hundred thousand acres for normal schools, and one-hundred and forty thousand acres for an agricultural college.

The Third Legislative Assembly of the State of Montana, in February 1893, enacted laws providing for the establishment of all these institutions, and locating the State University at Missoula, the State School of Mines at Butte the State Normal College at Dillon, and the State Agricultural College at Bozeman.

As the lands granted for higher educational purposes, together with timber or stone thereon, have been sold, the proceeds have gone into permanent funds invested for the various institutions, and the interest on these funds, together with the rentals of unsold lands, has been used for the support of the respective institutions. These maintenance resources have been supplemented with appropriations made each subsequent biennium by the Legislative Assembly, which has also provided for the erection of buildings at the expense of the State.

These institutions were administered independently by local executive boards for some years under the general supervision of the State Board of Education; by a law of 1909 the powers of the local boards were more closely defined and the direction of the State Board of Education made more effective. By the enactment of Chapter 92 of the Laws of the Thirteenth Legislative Assembly in 1913 the four institutions were combined into the University of Montana under the executive control of an officer whose title is Chancellor. In October, 1915, the State Board of Education appointed Edward C. Elliott, then of the University of Wisconsin, as the first Chancellor of the University of Montana. He asumed his duties February 1, 1916.

State College of Agriculture and Mechanic Arts

HISTORICAL SKETCH

By an Act of the Third Legislative Assembly of Montana, February 16, 1893, signed by Governor J. E. Rickards, the Agricultural College of the State of Montana was located at Bozeman. This Act provided for an Executive Board which should have the immediate control and direction of the affairs of the College, subject only to the general supervision of the State Board of Education. The Executive Board was authorized to appoint a secretary and treasurer and to choose a president and faculty.

On March 21, 1893, the State Board of Education held its first meeting at Bozeman. A site of forty acres for campus was donated by Nelson Story, Sr. An adjoining one-hundred and sixty acres of land, owned by Gallatin county, was donated, one-half by the county and one-half by the citizens of Bozeman. An executive Board was appointed. The Executive Board chose Luther Foster for Acting President. On April 17, with the President and an assistant, instruction was begun. September 15, the College opened for its first full year's work. A. M. Ryon was president and the faculty numbered six. Courses were offered in agriculture, domestic economy, and applied science, the last being chiefly engineering and chemistry. There was also established a one-year preparatory course, a two-years business course modeled after the usual private business college, and a music department.

Nelson Story, Sr., donated the use of a frame building which had been occupied as a Presbyterian Academy. The public school board allowed the use of some rooms in a nearby school building. During the summer of 1894 the brick veneer building now used for biology was erected out of the Hatch Experiment Station Fund.

The Legislative Assembly in 1895 authorized a bond issue of $100,000.00 to provide funds to erect and furnish buildings for the college.

By the enactment of Chapter 92 of the Laws of the Thirteenth Legislative Assembly in 1913, the State University at Missoula, the State School of Mines at Butte, the State Normal College at Dillon, and the State Agricultural College at Bozeman were combined into the University of Montana, under the executive control of an officer whose title is Chancellor.

The Enabling Act, providing for the admission of Montana into the Union, approved February 22, 1889, Section 16, grants ninety thousand acres of land to Montana for the use and support of an

agricultural college according to the terms of the Act of Congress, July 2, 1862, and Section 17 grants an additional fifty thousand for the same purpose and subject to the same conditions and limitations as the other grant. The one hundred and forty thousand acres of land cannot be sold for a price less than ten dollars per acre and the principal, together with all money received from the sale of timber, is to be invested as a permanent endowment. The unsold land may be leased and the rental together with the interest on the permanent endowment shall be used for the maintenance of the college.

The Act of Congress of August 30, 1890, appropriates twenty-five thousand dollars annually out of the treasury of the United States. By the Nelson Bill passed March 3, 1907, this amount was increased annually by five thousand dollars each year beginning in 1907 until now the total annual appropriation has reached fifty thousand dollars, at which figure it is to remain.

The Smith-Hughes Act of Congress, February, 1917, provides a plan for Vocational Education in Agriculture, Home Economics and the Trades and Industries. The training of teachers under the federal plan for Vocational Education as authorized by the Smith-Hughes Act is the work of the College. The federal government makes an annual appropriation of $5,000.00 and the State Legislature, a like amount.

PURPOSE AND SCOPE.

The purpose of the colleges of agriculture and mechanic arts is chiefly to provide collegiate education in agriculture, engineering, home economics, and applied science, for the young men and women of the respective states in which they are located. The scope of the Montana State College is set forth in the two so-called Morrill Acts of Congress, which authorized this class of institutions and supplied in part endowment and funds for maintenance; and in an act of the Montana Legislature accepting the land and money grants from the national government.

The first Morrill Act of Congress of July 2, 1862, making a land grant for the partial endowment of the agricultural and mechanical colleges, states that the income from these lands shall be used to maintain colleges "where the leading object shall be, without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

The second Morrill Act of Congress, August 30, 1890, making an annual appropriation out of the treasury of the United States for the further support and endowment of these colleges, provides that this fund is "to be applied only to instruction in agriculture and mechanic

arts, the English language, and the various branches of mathematical, physical, natural and economic sciences, with special reference to their application to the industries of life; and to the facilities for such instruction."

The Act of the Montana Legislature, approved February 16, 1893, accepts these grants of lands and money and provides that the Montana State College shall have for its object, "Instruction and education in the English language, literature and mathematics, civil and mechanical engineering, agricultural chemistry, animal and vegetable anatomy and physiology, the veterinary art, entomology geology, and such other natural sciences as may be prescribed by the State Board of Education; political, rural and household economy, agriculture, horticulture, history, bookkeeping, and especially the application of science and the mechanical arts to practical agriculture in the field, and irrigation and the use of water for agricultural purposes."

THE COLLEGE CAMPUS AND FARM

The grounds and farm contain four hundred acres. Forty acres in the immediate vicinity of the buildings constitute the campus and recreation grounds, which are in lawn, interspersed with flower beds, shrubbery, trees and driveways. On the campus are located a quarter-mile track, a baseball diamond, a football field, and three cement tennis courts. The remainder is used for farming and experimental purposes.

BUILDINGS

Montana Hall is situated in the center of the college campus. It is three stories high, and has a basement, which furnishes quarters for the department of physics and mechanical drawing. On the first floor are offices for the president, registrar and secretary, a room for the Young Women's Christian association, a class room, and the south half of the first floor contains the reading room and library, and an office for the librarian. The north half of the second floor is devoted to the art department, the arrangement being such that three large rooms can be thrown together by sliding doors. The south half of the second floor, has one office and four recitation rooms. The third floor contains the large assembly hall and seven class and music rooms.

Hamilton Hall is the dormitory for women. It was named by the faculty for the late Mrs. James M. Hamilton. The rooms are single and in suites, and all rooms have both hot and cold water. In the basement are the store rooms, laundry, quarters for servants, kitchen and large dining room. The first floor contains reception rooms, the dean's suite, guest room and a number of rooms for students. The second and third floors are for students.

Agricultural Hall is a four-story building. The north half of the

first floor contains the quarters for dairying, consisting of store rooms, office, class room, butter and cheese rooms and laboratories. A part of the south half of this floor is used for horticulture and has seed room, office, class rooms, work room and laboratory. The other part of this floor is occupied by the experiment station chemistry laboratory. The north half of the second floor is occupied by the agronomy department with office class room, dry-land office, soil and grain laboratories. In the south half are offices for the director of the experiment station, director of the extension service. class room, office and laboratory for the department of animal industry. Most of the third floor is devoted to home economics and contains two large kitchen laboratories, a dining room, two class rooms, two sewing rooms, and office. On this floor is the typewriting room and a class room for the secretarial department.

The fourth floor has an assembly room and class rooms for secondary students; and the offices for the principal of the secondary schools, and members of the extension staff.

Adjoining the Agrcultural Hall on the south is the greenhouse. In the center of the front is a palm room, and on both sides flower and vegetable rooms. Through the center is a plant breeding room and on the west a propagating room.

The Chemistry Building was completely destroyed by fire on October 20, 1916. An appropriation was made by the Fifteenth Legislative Assembly to replace the loss by a modern building, which it is hoped will be ready for occupancy in October, 1918.

The Biology Building is three stories with basement. On the top floor is a lecture room and a museum containing the zoological collection. On the floor below are three laboratories for bacteriology, botany, and zoology, and an office and work room for the botanist. The west half of the first floor is a large laboratory for general biology, and the east half is ocupied by the office, library and work room for the entomologist. The basement contains work rooms, class rooms, store rooms herbarium room, and dark room. Attached to this building on the south is a greenhouse for botanical purposes, and an insectary, for the study of living insects. The greenhouse is divided into two rooms, one for experimental work, and the other for laboratory use.

The Engineering Laboratory is a two-story building, with a frame annex. The first floor contains the dynamos, motors, and other machinery and apparatus, offices and students' reading room. The second story is occupied by the storage battery, photometer and electric light rooms, class rooms, and offices. The first floor of the annex contains the cement laboratories, and the second floor is used for electrical designing. There is also laboratory space, occupied by material testing machines, a refrigerating machine, various steam and gas engines, tractors, etc. This last named laboratory also contains a large flume for hydraulic testing and a weir box for determining constants used for various forms of weirs. Adjoining the

laboratory on the west is the heating plant for the college.

The Shops contain a forge shop a machine shop, an office, a wash room and a tool room. It has one wing for wood work, and another for foundry use.

The Gymnasium is a frame building. On the ends and the sides are permanent seats amphitheater style. It furnishes a convenient place for gymnasium practice, basketball and other indoor athletics. An addition at the rear and sides provides a director's office, two locker rooms, dressing room for women, shower and needle bath rooms, and a material room.

The College Farm Buildings are eight in number, located on the college farm adjacent to the campus. These buildings are the dairy barn, veterinary building, horse barn, beef cattle barn, sheep barn, seed barn and granary, the piggery and poultry plant.

COLLEGE SURROUNDINGS

Bozeman, the county seat of Gallatin county, is on the main line of the Northern Pacific railroad, and on a branch of the Chicago, Milwaukee & St. Paul railroad. For convenience, healthfulness and beauty of surrounding the location is unsurpassed. The college is situated on an elevation which commands a view of one of the most fertile valleys in the world, covered far and wide with grain fields, and surrounded on all sides by lofty mountains.

Bozeman is a city of homes and churches with a wholesome moral environment. It is a most desirable residence city for families who wish to educate their children. The college is reached from the railroad stations and city by an electric car line.

REQUIREMENTS FOR ADMISSION

Applicants for admission must be at least sixteen years of age and must present evidence of good moral character.

The completion of a high school or preparatory course of four years is the standard for regular entrance to the freshman class. This must include at least fifteen units of work. The term unit means one subject pursued for at least thirty-six weeks with not fewer than five recitations per week of forty-five or more minutes each. Two periods of laboratory, shop, or drawing work count the same as one recitation.

Applicants for admission without condition to the freshman class must present three units in English composition and literature and are advised to include among the required fifteen units at least the following:

Mathematics, 2 units.
Science, 1 unit.
History, 1 unit.

Candidates for admission to the school of home economics and mechanic arts and the school of agriculture must have completed the eighth grade in the public schools or its equivalent. There are no set requirements for music and the short agricultural courses, all being admitted who give evidence of being able to profit by the work.

Admission without condition to the courses in engineering requires three years of mathematics and one year of physics.

Admission on Certificates.

Graduates of the accredited high schools of Montana obtain admission by presenting certificates of principals stating subjects taken, time given for each, and grades obtained.

Blanks for such certificates are furnished by the registrar. These should be secured, filled out and filed in the registrar's office on or before the first day of registration.

List of Accredited High Schools.

1917-1918

District High Schools: Alberton, Anaconda, Baker, Belgrade, Belt, Billings, Bridger, Butte, Camas Prairie, Chinook, Columbia Falls, Columbus. Conrad, Corvallis, Culbertson, Cutbank, Forsyth, Fromberg, Glasgow, Great Falls, Hamilton, Hardin, Harlowton, Havre, Helena, Hysham, Joliet, Laurel, Lavina, Libby, Malta, Manhattan, Moore, Plains, Plentywood, Polson, Potomac, Pony. Ravalli, Roundup, Ryegate, Shelby, Sheridan, Sidney, Stanford, Stevensville, Terry, Thompson Falls, Three Forks, Valier, Victor, Virginia City, Whitefish, Whitehall, White Sulphur Springs, Worden.

County High Schools: Beaverhead, (Dillon); Broadwater, (Townsend); Carbon. (Red Lodge); Choteau, (Fort Benton;) Custer, (Miles City;) Dawson, (Glendive;) Fergus, (Lewistown); Flathead, (Kalispell); Gallatin, (Bozeman); Granite, (Philipsburg); Jefferson, (Boulder); Lincoln, (Eureka); Missoula (Missoula;) Park, (Livingston); Powell, (Deer Lodge); Sweet Grass, (Big Timber); Teton, (Choteau); Wibaux, (Wibaux).

Private Schools: Academy of Montana Wesleyan University. (Helena); Academy of Mount St. Charles College, (Helena); Butte Business College, (Butte); Central High School, (Butte); Loyola High School, (Missoula); Mount Angela Ursuline Acadmey, (Great Falls); Polytechnic Institute (Billings); Sacred Heart Academy, (Missoula); St. Vincent' Academy, (Helena).

Preparatory work done in other schools than those accredited may receive credit. Applicants from such schools should present certificates, stating the same points as those given from accredited schools. Blanks for this purpose are furnished by the registrar. When the evidence of certificate is not clear and satisfactory, examinations will be given.

Graduates of high schools not in Montana are admitted on certificates without examination, if such high schools are accredited to their own state universities.

Admission on Examination.

Applicants wishing to receive entrance credits on subjects for which they do not present satisfactory certificates are required to take examinations on days prescribed in the calendar.

Those who are preparing to take entrance examinations should correspond with the registrar for suggestions in regard to such preparation.

Conditional Admission.

The entrance requirement of the completion of a four-years preparatory course with at least fifteen units of credit, may be modified in individual cases by permitting the conditional admission of students otherwise qualified if they are entitled to at least thirteen admission units.

Entrance conditions must be removed within one year from the time of admission. This may be accomplished by private study or tutoring and the passing of entrance examinations; by arranging to take the requisite courses in the regular classes of the Gallatin County High School; or by transferring certain college credit hours and counting them toward entrance standing instead of toward graduation.

Admission of Special Students

Students twenty-one years of age or older, not candidates for degrees may be admitted without the usual entrance units, as special students, if they give satisfactory evidence that they are prepared to pursue successfully the special courses desired.

Special students may acquire status as regular students and become candidates for degrees upon complying with the rules of admission and graduation.

Admission to Advanced Standing.

Students entering from collegiate departments of other colleges and universities must bring certificates of honorable dismissal.

Grades brought by a student from other institutions of approved standards will be accredited in this college, but only after personal conference with and approval by the head of the department in which credit is desired. Students must present note books for work in which they have had laboratory courses and desire advance credit.

REQUIREMENTS FOR GRADUATION.

Bachelor's Degree—Candidates for the bachelor's degree must complete satisfactorily one of the college courses. Students who are relieved for any reason of the requirements in military science or physical education shall present six additional credits in some other subjects.

In order to complete a course satisfactorily and receive a degree a student must earn as many points as there are credits in the course. In calculating points, A grades count three times as many points as credits allowed for the subject, B grades twice as many points, C grades count the same number of points as credits, and D grades count nothing toward graduation.

All students who are candidates for the bachelor's degree must have completed all the required subjects listed in the course and a minimum of not less than 216 credits.

All students whose points are two and one-fourth times the number of credits at the time of graduation will receive the degree "With Honors."

For convenience in estimating the requirements for a degree, the following rules are laid down: One hour a week, for a quarter of recitation or lecture work, two or two and one-half hours a week for a quarter of laboratory, shop, library work, or drawing shall count as one credit.

Attention is called to the fact that on October 1, 1917, the definition of the term credit was changed, by the transfer to the quarterly, instead of the semester calendar. The new credit in time value counts just two-thirds as much as the old. Students who received credit on the books prior to October 1, 1917 in computing their standing by the present system should add fifty per cent to the number of credits and points.

If for any reason the full time is not occupied in the shop, laboratory, drawing room or library, the remainder shall be used under the supervision of the instructor for outside work.

No regular student may take in any one quarter, work amounting to less than twelve credits, nor more than nineteen, unless a greater number are prescribed in the course.

Advanced Degrees.

Master's Degree—The Master of Science degree is conferred in the following departments: Botany and bacteriology, chemistry, entomology and zoology. To become a candidate the student must hold a bachelor's degree from the University of Montana or from another institution of equal rank approved by the committee on graduate studies of the State College of Agriculture and Mechanic Arts. The candidate will be required to meet the following conditions:

1. He shall name the particular branch of science in which he

hopes to receive the degree and present evidence of sufficient preparation in this branch.

2. One full year or three quarters of residence study amounting to at least forty-five credits of work is required.

3. There shall be a major subject and one or two minor subjects and at least one-half of the work must be done in the major subject.

4. The major work shall be in advance of all undergraduate courses in the college but the minor subjects may be selected from among courses pursued for the bachelor's degree. The minor subjects shall be approved in advance by the committee on graduate studies.

5. The head of the department in which the major work is selected shall be the candidate's class adviser.

6. With the aid of the adviser the candidate shall prepare and submit in writing to the committee on graduate studies, not later than the second week of his resident study, a program of the work which he intends to do as a candidate for this degree. The committee will thereupon report to the candidate and to the faculty its action on the candidacy.

7. The candidate shall present a thesis, which shall be a part of his major work.

8. The candidate will offer himself for examination in his major and minor studies. This examination will be under the supervision of the committee on graduate studies and may be oral or in writing. This committee will appoint a special examining committee.

Graduate students are required to pay the regular matriculation fee and all course fees. They will not, however, be expected to pay the student activity fee.

Engineering Degrees — The professional engineering degrees, Architectural Engineer, Chemical Engineer, Civil Engineer, Electrical Engineer, and Mechanical Engineer will be conferred upon graduates who present satisfactory evidence of professional work of superior quality extending over a period of not less than three years. Candidates for these degrees will be required to meet the following conditions:

1. The candidate shall submit a record of his professional experience and the subject of his thesis to the committee on graduate studies for their approval not later than January first preceding commencement.

2. He shall present a bachelor's degree in the same branch of engineering in which he becomes a candidate for the advanced degree.

3. The candidate shall present a satisfactory thesis.

4. He shall offer himself for examination before a committee of the faculty, which shall be appointed by the committee on graduate studies.

EXPENSES OF STUDENTS.

Board and Room for Men.

There is no men's dormitory connected with the college. Fraternity houses are maintained by students which accommodate a number for board and room. Students who do not have their homes in Bozeman find room and board in private families convenient to the college, for $26 to $35 per month. The total college expenses for the year, including fees, books, room, board and incidental expenses, may be estimated from $325 to $425. A list of approved places with prices and accommodations is kept in the registrar's office. A committee of students meets all trains on registration days and at other times on request, and aids in finding satisfactory locations.

Board and Room for Women

Hamilton Hall is the college home for women. The Hall is under the supervision of the house director, and the residents have the care and training necessary for a family of students. The price of rooms (including board) varies according to location and size of room. Because of the unusual fluctuation of food costs the following prices are subject to change at any time during the year:

One in single room	$27.00
Two in single room (each)	25.50
Two in double room (each)	26.00
Two en suite (each)	29.00
Three en suite (each)	27.00

The above prices are for a calendar month. Of these amounts $20.00 is for table board and the remainder for room rent. Application for rooms in the hall may be made at any time to the house director, and must always be accompanied by a deposit of $5.00 to insure a reservation. This amount will be returned if the house director is notified before September 26, or will be deposited until the room is vacated. When the room is vacated if, in the judgment of the house director the room and furniture have not been injured more than could be expected from the ordinary wear and tear, the $5.00 shall be refunded. If either the room or the furniture has been injured more than would be due to ordinary wear and tear, such portion of the $5.00 shall be retained by the institution as will be needed to make good the damage. Residents who leave the Hall before the close of the quarter will be required to pay the room rent till the end of the quarter. Payment for room and board must be made on the fifteenth of every month in advance, and after five days thereafter an extra charge of $1.00 per week will be made as long as the bill remains unpaid, unless arrangements have been made to defer payment. Complete arrangements are made for the reception of the residents the day before

registration day, and no deduction will be made for late arrivals. The Hall will not be opened for occupancy until the day before registration day. No deduction is made for absences at week-ends or during vacations, except at the Christmas holidays, when room rent only will be paid. The residents may have guests at meals by making arrangements for same at the house director's office the day before, and may also have the privilege of the laundry by paying a small fee. The residents are expected to furnish their own towel supply, dresser and table scarfs, and have same laundered; also white scrim curtains, a napkin ring and any room decorations they may fancy.

Railroad Fare Refunds.

In accordance with the provisions of Chapter 123 of the Session Laws of 1917, enacted by the Fifteenth Legislative Assembly, and under regulations established by the State Board of Education, railroad fare in excess of five dollars actually paid by any student for a round trip between his Montana home and any institution of the University of Montana once each year, will be refunded.

No war tax that has been paid by any student will be refunded under any conditions whatever; but if students whose fare is five dollars or more apply in advance to the registrar, they can obtain blanks by use of which they may secure exemption from the war tax on transportation.

FEES AND DEPOSITS.

A fee is a fixed charge no part of which is returnable except as specified under refunds. A deposit is intended to serve as a security against losses and breakage. Any unused balances are returnable.

Registration Fee.....$10.00

Payable annually in advance by each college student in attendance during the autumn, winter, or spring quarter. In no case will any part of this fee be refunded.

Short Course Registration Fee.....$6.00

Payable annually in advance by each student in the School of Agriculture, the School of Home Economics, and the School of Mechanic Arts. In no case will any part of this fee be refunded.

Registration Fee, Summer Quarter.....$10.00

Payable in advance by all students attending the summer quarter. In no case will any part of this fee be refunded.

Associated Students Activity Fee.....$7.50
Payable annually in advance by all college students entering the autumn quarter. Students entering for the winter or spring quarter pay $2.50 per quarter.

Associated Short Course Students Activity Fee.....$5.00
Payable annually in advance by each student in the School of Agriculture, the School of Home Economics, and the School of Mechanic Arts. Students entering for the winter quarter pay $2.50 per quarter.

Late Registration Fee, during the first week of the quarter.....$2.00
Payable by students registering after the prescribed registration days of any quarter, except students entering for the first time.

Fee for Removing Conditions.....$2.00
Payable by students who take condition examinations at times not regularly designated in the calendar.

Limited Registration Fee, each course, per quarter.....$2.00
Payable by special students registering for not more than two courses. The total credits for the courses shall not exceed six.

Special Attendance Fee, each course per quarter.....$2.00
Payable by adults not regularly registered but attending classes as listeners.

Library Deposit.....$3.00
Payable by all students.

Note:—The following fees and deposits are given per quarter:

Agriculture.

Number of Course	Fee.	Deposit.
Agronomy: 1, 2, 11	$1.00	$1.00
Agronomy c	.00	1.00
Animal Husbandry: a, b, c, d, 1, 1a, 2, 2a, 3, 6	1.00	.00
Animal Husbandry: e, f, 11	2.00	.00
Dairy: 1, 2,	1.50	.50
Dairy: a	2.00	.50
Dairy: b, c	1.00	.50
Horticulture: 1	1.50	1.00
Horticulture: 4	5.00	.00
Horticulture: a, 6	1.00	.00
Poultry Husbandry: 46	1.00	.00
Veterinary Science: 51	2.00	.00

Art

Number of Course.	Fee.	Deposit.
Art: a, b, 1, 1a, 1b, 2, 2a, 3, 3a, 4, 7, 7a, 7b, 7c, 8a, 8b, 8c, 9, 15, 16, 18a, 18b,	.50	.00
Art: 11, 12, 13, 14	3.00	.00
Art: 10	2.00	4.00
Art: 19	1.00 to 5.00	.00

Botany and Bacteriology.

Botany: a	1.00	.00
Botany: 1,	2.00	2.00
Botany: 2, 4, 5,	3.00	.00
Botany: 3	3.00	3.00
Botany: 11	1.00	4.00
Bacteriology: 12, 14,	4.00	3.00
Bacteriology: 15,	3.00	2.00

Chemistry

Chemistry: 1	5.00	3.00
Chemistry: a, 2, 3, 4, 5, 8, 9, 11, 12, 14, 17, 18, 22	4.00	4.00
Chemistry: 7	6.00	4.00
Chemistry: 19	2.00	2.00

Mineralogy

Geology: 2	3.00	3.00

Entomology and Zoology

Zoology: 1, 2 3, 12	3.00	.00
Entomology: 4	2.00	.00
Entomology: 5, 6, 7,	1.00	.00
Entomology: 8	1.50	.00
Entomology: 10	1.50 to 7.50	.00

Engineering

Architectural: 1, 4, 10, 11, 14, 15, 16	1.00	.00
Civil: 1, 1a, 2, 4, 9, 28, 30, 32, 39	1.00	2.00
Civil: 8, 34, 38, 44,	2.00	2.00
Electrical: 4, 6, 10, 12, 14a,	1.00	5.00
Electrical: 12a	.50	5.00
Mechanical: 2a	1.00	.00
Mechanical: 4, 15a	1.00	.00
Mechanical: 2, 9, 32	1.00	1.00
Mechanical: 2b, 21, 27, 28, 34	1.00	2.00
Mechanical: 2	2.00	2.00

Mechanic Arts

Mechanic Arts: d, e, t, q	1.00	.00
Mechanic Arts: f, g, h, j, r, s, u, w	1.00	1.00
Mechanic Arts: a	2.00	1.00
Mechanic Arts: b	2.00	2.00
Mechanic Arts: a1, b1, d1, h1	.00	4.00

Physics

Physics: a, c, 1a, 2, 4, 5, 9,	1.00	1.00

Home Economics

Home Economics: b1, d, j, 7,	.50	.00
Home Economics: a, b, 12, 13, 14, 16, 19	1.00	.00
Home Economics: c, h1,	1.50	.00
Home Economics: e, 11, 11a, 17, 18	2.00	.00
Home Economics: g, 2, 8, 15	3.00	.00
Home Economics: 4, 5, 6, 22, 23	4.00	.00
Home Economics: 10	.00	.50 to 6.00
Home Economics: h, 1a, 1b	2.50	.00

Secretarial.

Secretarial: 3,	1.00	.00
Secretarial: 4, 12, 14	.50	.00

Trades and Industry.

Trades and Industry: 1, 2, 6	3.00	.00
Trades and Industry: 3	1.00	.00
Trades and Industry: 4, 5	2.00	.00
Trades and Industry: 11	4.00	.00

Music.

Piano one half hour lesson per week	$12.00 to $15.00
Piano, two half hour lessons per week	23.00 to 27.00
Piano, ensemble playing	7.00
Voice, one half hour lesson per week	15.00
Voice, two half hour lessons per week	27.00
Violin, one 45 minutes lesson per week	18.00
Violin, two half hour lessons per week	24.00
Violin, one hour ensemble lesson per week	18.00
Piano Rent, one hour per day	3.00
Piano Rent, each additional hour per day	2.50

Dormitory Room and Board.

Dormitory Room and Board, a month $25.00 to $29.00
Depending on room.

Special Fees for Summer Quarter.

Chemistry	$1.50
Cooking	3.00
Handicrafts	3.00
Manual Training	1.50
Primary Methods	1.00
Public School Drawing	1.00
Sewing	1.00

REFUND OF FEES.

Registration Fees:

Registration fees, (including summer quarter registration, late registration, limited registration, and special attendance fees) will not be refunded under any circumstances.

Associated Students Activity Fees:

Students who have entered the autumn quarter and paid the annual associated student activity fee will receive a refund of one half the amount paid if they leave at or before the close of the autumn quarter. There will be no refunds on account of withdrawals after the opening of the winter quarter.

Music Fees:

When music students withdraw before the end of a quarter, $1.50 will be retained for each lesson period up to the time of withdrawal, and any balance remaining will be refunded.

No piano rentals will be refunded.

Laboratory Fees:

Students withdrawing by the beginning of the second week of any quarter will receive a refund of 90% of the laboratory fees paid for the quarter. Those withdrawing by the beginning of the seventh week will receive a refund of 40% of the laboratory fees paid for the quarter.

REGISTRATION

Time for Registration.—The time set for registration of students is the first two days of the autumn quarter and the first day each of winter and spring quarters. The class room work begins the first day following registration day. Students will not be registered on days not listed for registration, except at the convenience of class advisers between four and five in the afternoon. Those who fail to present themselves for registration on the days designated for registration in any quarter, will be permitted to register later in the first week, only upon the payment of a special fee of $2.00 in addition to regular fees.

Change of Registration.—A student desiring to change his studies will present his request to his class adviser, who, after consulting all teachers interested, will take such action as he may deem best. A change in course of study is allowed by vote of the faculty only.

Registration by Mail.—Most of the details of registration can be arranged in advance by mail, and students are requested to arrange their work so far as possible in this way. Those who enter the institution for the first time should write several days in advance of the college opening enclosing their credentials, to the registrar of the college, and should state the work which they wish to take. These documents will be examined and the student's classification will ordinarily be determined before his arrival, so that much time in registration may be saved. Those who have been already enrolled in the institution should send a letter to their class adviser several days in advance of the registration days. telling clearly the work which they plan to take, and in case of elective subjects, stating briefly the reasons for their choice.

If these steps are taken by students, registration should be completed with a minimum expenditure of time; but no student's registration will be complete until he applies at the college in person.

Students who plan to arrange their registration by mail, as specified above, should study carefully the entrance requirements for the courses in which they are interested, and the prerequisites to the various subjects which they wish to take.

MISCELLANEOUS INFORMATION.

Scholarship and Attendance.

Government.—Students are expected to conduct themselves as ladies and gentlemen; those who fail to comply with this demand will be requested to leave the institution.

Leave of Absence.—When it is necessary for a student to be absent from the city, application must be made to the president for leave of absence. A leave of absence is justification for absence from class, but does not give relief from the work omitted.

Honorable Dismissal.—Students intending to sever their connection with the institution, either indefinitely or permanently, should report as soon as possible to the president either in person or writing, giving proper explanation, and should apply for an honorable dismissal. Students leaving the institution without such honorable dismissal (except at the end of a quarter), will not be readmitted to the college at any later time, nor will any report of grades in credit for work done here be sent out until satisfactory explanation is made.

Passing Grades.—Passing grades are marked A, B, C, or D. An average stading from 90 to 100 is A, from 80 to 90 is B, from 70 to 80 is C, and from 60 to 70 is D.

Conditions and Failures.—Work not of a passing grade shall be marked E, if in the judgment of the instructor it can be made up or completed without repeating the course in class. Work not of a passing grade shall be marked F, if in the judgment of the instructor it cannot be made up or completed without repeating the course in class. A mark of E is a condition and may be removed by an examination or in such other manner as the instructor may prescribe. Examinations for removing conditions shall be held on the days designated in the college calendar. A mark of F is a failure and must be made up by repeating the subject in class. When a condition is not removed by the time the subject is offered the following year it lapses into a failure. The above marks apply to laboratory, shop work, drawing and other exercises, as well as to lecture and recitation courses.

Scholarship.—The names of students making grades of D, E, and F are reported to the registrar's office at intervals approximately six weeks apart, as indicated in the college calendar. Names of delinquent students are then reported to the scholarship committee, who immediately advise these students of their delinquences. It is the sense of the faculty that students not passing in ten credits are wasting their time and the students and their parents are notified by the scholarship committee that if the students are not passing in ten credits at the next report on the standing of students they are to be recommended to the faculty for dismissal. The report on regular quarterly examinations is considered the same as any other report on standings, and students who fail at the end of any quarter to pass in ten credits must be passing at the time of the first report in the following quarter.

The names of delinquent students are sent to the chancellor, president, registrar, and class advisers concerned.

Absences.—Students absent from required exercises are reported at the close of each day to the registrar's office. On each Monday morning, there are posted on bulletin boards, the names of those students who are to appear before the absence committee. The committee, or one of its number, may be found each Monday afternoon at four o'clock in the office of the registrar, and deals with the cases of students whose names have been listed for consideration. In the case of frequent, unwarranted absences, the committee shall bring the case before the faculty for discipline. These regulations apply to all students in the institution below the grade of junior.

Class absences of juniors and seniors will not be reported until the instructor feels that members of these classes are wilfully remaining away from class and so wasting their time, and then these are

to be reported to the absence committee for consideration and to the faculty for discipline. The instructors deal with tardiness in such manner as they deem best.

Assembly.—Students are required to attend the assemblies held on each Friday during the college year, and all special assemblies. The programs of these assemblies consist of addresses, music, recitals, illustrated lectures, etc.

Employment and Aid for Students.

A number of students earn a part of their expenses while in college. Students expecting to work their way should come with sufficient money to pay their expenses for one quarter unless they have engaged work in advance. The college cannot guarantee employment, but those who are willing to give efficient, faithful, service have usually found work.

A few students are employed as janitors and assistants in the shops, laboratories and barns. Others care for furnaces, horses and cows in the city, work in stores and at various kinds of house work. Calls for young lady students to work for their board and room are numerous.

Students readily find employment at profitable wages during the summer vacation.

Engineering students are placed with the reclamation service, the railroads, and the electric power plants.

STUDENT ORGANIZATIONS.

Young Women's Christian Association.

The object of this association is the symmetrical development of Christian womanhood and the rendering of social service. To this end it conducts devotional meetings, Bible and mission study classes, and carries on an employment bureau for college women; homes are found where college women may receive their board and room in return for their services. This work has been standardized and is supervised by the home economics seniors of the Y. W. C. A. The Y. W. C. A. sends delegates to the Northwest Conference and keeps in touch with the state, national and international association.

Debating.

The management of the work in inter-class and intercollegiate debating, in extemporaneous speaking, and in oratory, is now vested in the manager appointed by the Associated Students, and the Coffee Club, which works in cooperation with the department of English. There is an established debate each year between the freshman and sophomore classes. There are state contests in oratory and extemporaneous address and several intercollegiate debates.

The Exponent.

The students of the college maintain a weekly paper, The Exponent. The paper is well supported by the students and advertisers and is one of the most important student enterprises. It affords the members of the staff very valuable literary training.

Athletic Council.

This organization, composed of representatives from the faculty, alumni association and student body, has general control over all branches of athletics. Football, basketball, baseball, track and tennis are at present recognized.

Branch of the American Institute of Electrical Engineers.

A branch of this society is maintained at the college. Regular monthly meetings are held at which original papers are read or those of the Institute discussed. Students and teachers are kept in touch with practical engineers and their problems. Only regular members or student members of the American Institute are eligible to membership in this branch. There is, however, an Electrical Club, which includes all the members of the Institute and all other students in the electrical engineering course.

The Civil Engineering Society.

The students of the department of civil engineering organized this society for the purpose of promoting their interests in matters of practical importance to engineering students and alumni. Prominent engineers who have succeeded in special fields frequently meet with the members of the society to discuss the problems of their field.

College Band.

The college band is one of the best amateur musical organizations in the state. The college provides instruments, music and instruction. The band is divided into two sections, beginners and experienced players. This gives a splendid opportunity for those who have never played and those who have some skill in the use of instruments. One-half credit per quarter is allowed those who register in the band.

Glee Club.

Men are admitted upon examination as to musical qualifications and the membership is limited to about sixteen. Instruction and music are furnished free by the music department. Both popular and high class works are studied. One half credit per quarter is allowed those who register in glee club.

Treble Clef Club.

This club for young women corresponds in scope and work to the men's glee club. Membership is limited to about twenty. This club is also under the direction of the music department. Both Glee and Treble Clef clubs appear at college functions and recitals during the year. One-half credit per quarter is allowed those who register in this club.

Orchestra.

The orchestra is an organization composed of students of the college. The membership numbers about twenty and the club meets twice a week for practice. Some light symphonies are worked out by the orchestra during the year.

Agricultural Society.

All agricultural students are eligible to membership in this society. Regular meetings are held for the discussion of topics of interest in scientific agriculture with special reference to the possibilities of farm life.

Home Economics Club.

This club is composed of women students who are working for a degree in home economics. Meetings are for the discussion of topics of interest to students in home economics and also to keep in touch with the work of the alumni of this department.

The Chemical Society.

The students taking the chemistry course join this society for the purpose of developing an interest in the professional side of the subject and also for studying topics that do not come up in regular class work. Regular meetings are held and abstracts of recent journal articles are presented.

The Alumnae Club.

The active members of this organization are women graduates, residing in or near Bozeman; the associate members are the undergraduate women. The object of the club is to promote the interests of college women.

Associated Students.

An organization consisting of the whole body of students of the institution. The society is organized to manage all matters of general interest to students as athletics, debates oratory, and entertainments.

Fraternities, Sororities, and Social Clubs.

There are two fraternities which are, as yet, only local organizations, the Omega Beta, with a house on South Sixth avenue, and the Kappa Nu who maintain a house on South Black avenue. The Sigma Chi, a national fraternity, has a chapter and maintains a house on South Third avenue. There is also a club for men known as Les Bouffons. There are two national sororities, the Alpha Omicron Pi. and the Phi Upsilon Omicron; a local sorority, the Phi Gamma, who have a house on Grand avenue, and two social clubs known as the Triple "S" and the Theta Xi. Fraternities, sororities and social clubs, like other student organizations, are under the supervision of the faculty.

SCHOLARSHIPS AND PRIZES.

High School Honor Scholarships

In order to promote the attendance of students of ability and promise upon the several institutions of the University of Montana it is the declared policy of the State Board of Education to provide for the awarding of scholarships to be known as "High School Honor Scholarships" to graduates of the accredited public high schools of the state

In the administration of this policy the number of scholarships awarded each year in any accredited high school will depend upon the number of graduates, as hereinafter specified. In no case, however, will more than two such scholarships be awarded each year in any high school for any one of the institutions of the University. High School Honor Scholarships may be awarded only to students who belong to the highest one-fourth of the graduating class in scholarship.

The following regulations will govern the awarding of High School Honor Scholarships:

1. Upon the presentation of the required certificate from the principal; the Chancellor of the University will authorize the award each year to graduates of each of the accredited public high schools of the state, High School Honor Scholarships for the component institutions of the University of Montana.

2. To be eligible for a High School Honor Scholarship the individual must be certified by the principal:

(a) To be a graduate of an accredited high school of the state;

(b) To belong to the highest one-fourth of his class in scholarship;

(c) To be a student of ability and promise of success in college or professional school; and

(d) To be the highest in scholarship of those members of the graduating class desiring to attend the university institution for which the honor scholarship is to be awarded.

3. No more than one honor scholarship may be awarded to the membership of any graduating class having seven or fewer graduates; no more than two scholarships may be awarded to the membership of any graduating class having eight to eleven graduates; no more than three scholarships may be awarded to the membership of any graduating class having twelve to fifteen graduates; no more than four scholarships may be awarded to the membership of any graduating class having sixteen or more graduates.

4. No more than two High School Honor Scholarships may be awarded each year in any high school for any one of the institutions of the University.

5. The holders of High School Honor Scholarships shall be exempt from the payment of all customary fees except the student activity fees and the special fees in the Schools of Law and Music. All holders of High School Honor Scholarships will be expected to make the required course deposits.

6. Any High School Honor Scholarship will become void unless the holder enters one of the institutions of the University within eighteen months after graduation from the high school. The holder of a High School Honor Scholarship must give notice to the Registrar of the institution of his intention to utilize the scholarship, not later than September first of the year in which he intends to enter the institution.

7. Any High School Honor Scholarship will be valid only as long as the holder is in attendance upon some regular course leading to graduation; provided, however, that no High School Honor Scholarship shall be valid for a period longer than five years.

8. In case any individual to whom has been awarded a High School Honor Scholarship relinquishes the scholarship without entering the institution, or for any reason fails to enter the institution in compliance with section 6 of the regulations, the high school principal may certify the next ranking eligible member of the same graduating class desiring to enter the particular institution.

9. The privileges of a High School Honor Scholarship may be retained only so long as the holder maintains a standard of scholarship and regularity of attendance satisfactory to the faculty of the institution at which he is in attendance.

Rules for Agricultural Club Scholarships.

1. Upon notice from the State Leader of Boys' and Girls' Agricultural clubs of the awards of the annual club contests, the Chan-

cellor will authorize the issuance of Agricultural Club Scholarships to the winners of first place in the corn, potato, garden, bread, garment-making, livestock, or other agricultural club contests in any county in Montana, and to winners of first, second and third places in the state agricultural club contest.

2. The Agricultural Club Scholarship shall be good in any one of the component institutions of the University of Montana which the holder may select, provided that in order to enter such institution, the holder must meet the entrance requirements in effect in such institution at the time the holder seeks to enter.

3. Holders of Agricultural Club Scholarships shall be exempted from the payment of all customary fees except the student activity fees and the special fees in the Schools of Music. They will, however, be expected to make the required course deposits.

4. Scholarships issued to winners of first place in county club contests shall be good for one year of attendance. Those issued to winners of third, second and first place in the state contest shall be good for two, three, and four years of attendance respectively.

5. Any Agricultural Club Scholarship will become void unless the holder enters one of the institutions of the University of Montana within eighteen months after the completion of his preparatory course. The holder must give notice to the registrar of the institution of his intention to utilize the scholarship, not later than September first of the year in which he intends to enter the institution, or immediately upon receipt of the scholarship.

6. Any Agricultural Club Scholarship will be valid only so long as the holder is in attendance upon some regular course leading to graduation, and maintains a standard of scholarship and regularity of attendance satisfactory to the faculty of the institution of the University of Montana at which he is in attendance.

Military Service Scholarships.

Upon the proper certification of the president that a student has rendered military or naval service to the nation and has been honorably discharged, the Chancellor of the University of Montana will authorize the award of a Military Service Scholarship to such student. The holders of such scholarships, throughout their course, will be exempt from the payment of all regular fees, but not laboratory deposits or special course tuitions.

Montana Federation of Women's Clubs Scholarships.

Upon the nomination of the officers of the Montana Federation of Women's clubs, the State Board of Education has authorized the award of one scholarship each year in each of the institutions of the

University. The holders of such scholarships are exempted from the payment of all customary fees, except the student activity fees and the special tuition fees in music. They are expected to make the required course deposits.

The Federation of Women's Clubs assumes the payment of expenses for board, room rent, necessary books, course deposits, student activity fee, and gymnasium suit.

Y. W. C. A. Scholarship.

Every four years the Y. W. C. A. offers a scholarship to a woman high school graduate who might otherwise be unable to attend college. Selection of a woman is made from among the applicants on the basis of character and scholarship. The woman elected is given her fees, books, and student activity ticket, and a good home is found where she may work for her room and board.

Prize in Oratory.

An annual prize of twenty dollars is given to the winner of the annual local oratorical contest. This is open to all students. The winner represents the college in the state oratorical contest.

Armstrong Prize in Declamation.

Hon. F. K. Armstrong of Bozeman, gives a prize of ten dollars to the winner of the annual declamatory contest of the secondary schools. There is also a second prize of five dollars. Only regular students are eligible.

Story Prize in Extemporaneous Speaking.

Hon. Nelson Story, Jr., gives an annual prize of twenty-five dollars toward an Extemporaneous Speaking Contest. Fifteen dollars is given as first prize, and ten dollars as second prize. This contest is open to all regular students of the secondary schools.

STUDENT LOAN FUNDS.

General University Student Loan Fund.

The Montana Banker's Association, and the Alumni of the University of Nebraska residing in Montana, have each established funds which are available for students in the junior and senior classes of any of the institutions of the University of Montana, who are unable to continue their studies without financial aid, and are satisfactorily recommended as to character and scholarship by the dean or director, or the head of the department in which the applicant's major work is done. The loan to any one student is limited to two hundred dollars during his course, and not more than one hundred dollars in any one year. Loans must be repaid within one year

from the time of borrowing, or in exceptional cases, one year after graduation. Loans bear two per cent interest.

Application blanks and a statement of detailed regulations governing these loans may be obtained from the registrar.

State College Alumni Loan Fund.

The Loan Fund Committee of this college makes every effort to assist worthy students who are in need of funds. Seniors and junior college students may apply to this committee for a loan.

Whenever possible, students who apply for a loan are aided to find work in order that they may earn the money required for their support.

ATHLETICS.

The gymnasium furnishes a convenient place for gymnasium practice, basketball and other indoor athletics. There are dressing rooms for both men and women, shower and needle bath rooms, and a material room. On the campus are located a quarter mile cinder track, a baseball diamond, a football field, and three cement tennis courts.

Eligibility for Athletics.

The rules governing eligibility of players shall be the same for all athletic contests in which any team plays an officially scheduled contest under the name of the college, whether the game be with another college, a club, or a secondary school. Each student representing this institution in an intercollegiate contest must be eligible according to the Rocky Mountain Faculty Athletic Conference rules.

Basketball Tournament, Speaking Contest, and Essay Contest.

The annual high school basketball tournament, speaking contest and essay contest are held on Wednesday, Thursday, Friday, and Saturday nearest the tenth of March. An invitation is extended to the sixteen high school basketball teams, who have during the basketball season proven their superiority in competition with other teams. Appropriate school trophies are presented to the best teams, and suitable individual awards are given to the team members. In connection with the tournament an extemporaneous speaking contest, and an essay contest are held.

LIBRARY AND READING ROOMS.

Main Library.

The library occupies the south half of the first floor of Montana Hall. It contains 16,314 volumes, not counting public documents, and about 6,000 pamphlets. It is well supplied with standard works

in technology, history, science, and literature, as well as with dictionaries, cyclopedias and other reference works.

By Act of Congress the library is a depository and receives all public documents and other printed matter issued by the the United States government.

Department Libraries.

The agricultural library occupies two rooms on the first floor of the Agricultural Hall. It contains almost complete bound sets for all state experiment station bulletins and United States Department of Agriculture publications, besides a large number of agricultural papers and standard works. One room on the first floor of the biology building is used for the library and periodicals of the biological department. A library and reading room is maintained by the College of Engineering.

Experiment Station

Associated with the State College is the Montana Agricultural Experiment Station. This station was established by an act of Congress, (Hatch Act), passed in 1887 and supplemented by another act, (Adams Act), passed in 1906. By these two acts $30,000.00 per year is given to the state.

In the words of these Congressional Acts, the purpose of these appropriations is as follows:

"It shall be the object and duty of said Experiment Stations to conduct original researches and verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under the varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test the comparative effects on crops of different kinds; the adaptation and value of grasses and forage crops; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective states and territories."

These acts define and limit the work of the Agricultural Experiment Station. It must be directed towards the solving of the practical agricultural problems of the state and making that industry more profitable to those engaged in it.

The appropriations from the Federal Government have been supplemented by State appropriations, which amount to $60,000.00 for the central station and $18,000.00 for the sub-stations.

The work covered by the Experiment Station is indicated by the ten departments of work, which are as follows:

Agronomy, Animal Husbandry, Poultry, Horticulture, Farm Management, Agricultural Engineering, Chemistry, Entomology, Botany and Bacteriology, and Veterinary.

The Experiment Station farm consists of about 260 acres of irrigated land adjoining the campus, and the Ft. Ellis farm of about 600 acres of non-irrigated land, some four miles out. Well equipped laboratories are also provided for the various departments, while all the farm buildings are arranged so as to facilitate the experiments with live stock. The equipment and facilities of the Experiment Station are available to a limited number of students for graduate work.

The great variations in the climate of the state make necessary

the establishment of sub-stations to study the crop possibilities of various sections of the state. At present four such stations are in operation, viz: In the Judith Basin near Moccasin; in the Yellowstone Valley near Huntley; in Northern Montana near Havre, and in the Bitter Root Valley near Corvallis. The last sub-station is for the study of fruit and garden crops only. While not covering all the climatic regions of the state these sub-stations afford opportunity for the more complete study of the state's agricultural possibilities and particularly of the crops adapted to particular sections of the state.

The results of the studies and observations made by the station staff are published in bulletins, circulars, leaflets, posters, etc. They are distributed free of cost to the people of the state who apply for them. Those who would like to receive the publications as issued may have their names placed on the permanent mailing list and receive the bulletins as soon as issued. Write to the Agricultural Experiment Station, Bozeman, Montana.

Agricultural Extension Service

The co-operative extension work in agriculture and home economics had its official beginning in the passage by Congress of the Smith-Lever Act of May 8, 1914.

It has been organized as the last of the three principal divisions of the State College. All federal and state extension service in Montana in agriculture and home economics has been placed in charge of an extension director.

The field work is grouped into two classes according to the area covered as state and as county service. The projects now under way are:

1. Agronomy.
2. Boys' and Girls' Club Work.
3. County Agent Work.
4. Extension Schools.
5. Dairy.
6. Farmers' Institutes.
7. Farm Management Demonstrations.
8. Home Economics.
9. Live Stock.
10. Marketing.

Agronomy consists of instruction and demonstrations in field crops, crop rotation, seeds, and soil management.

Boys' and Girls' club work consists of clubs for corn-growing, potato-growing, gardening, pig, calf, colt, and lamb raising, canning, bread, and garment-making.

County agents are in twenty-three counties, carrying on local projects in crop demonstrations, community meetings and organization, live stock, dairy, better seed, and rodent and insect control, and such incidental problems in farming and country life as may arise.

Extension schools in agriculture and home economics are held in farming communities by special arrangement, three to five instructors being provided by the extension service. classes continuing for three to six days.

The dairy work has to do with better cows, and better breeding sires, cow-test associations, silos and forage crops, feeding, shelter, and co-operative dairying.

Farmers' institutes have been held to the number of from one hundred to several hundred each year for about twenty years in Montana. The plan is to hold one and two-day meetings, in the agricultural centers of each county, each year, with lecturers distinguished as successful practical farmers or as agricultural scientists, at each meeting.

Farm management demonstrations seek to increase good economic farm practices, and eliminate the uneconomic, by keeping farm accounts and records. These are summarized, analyzed and studied. The farmer with this knowledge is able to expand his operations in the right direction, and retrench where it is unprofitable.

Home economics demonstrations in ten counties conducted by trained women seek to improve home conditions, health, and satisfaction in country living.

The live stock project aims at the improvement in live stock, a reduction of stock losses, and a better distribution of farm animals.

The marketing activities keep farmers better informed regarding markets for farm products, promote direct dealing between producer and consumer, and stimulate the production by securing better markets and more profitable sales of farm products.

The division of Extension Service has grown since 1914 from a staff of five people until March 1, 1918, it had a staff of seventy-five people.

Engineering Extension Service

The Engineering Extension Service has been inaugurated in order to give engineering instruction to those who desire information along engineering lines and who have not the time or the opportunity to attend college. The courses, arranged to aid those engaged in practical work, consist of lectures, discussions, recitations. drawing, etc. When a sufficient number apply for one or more courses, classes are organized and an engineering instructor visits the classes once a week, to lecture or to conduct class recitations. In this way the student comes in close association with the instructor. Among the courses offered are the following:

1. **Shop Calculations.** Calculations of shop problems; size of gear, pulleys, etc.

2. **Drawing Course.** 1. Instruction in the use of instruments, lettering and projections.

3. **Drawing Course.** 2. Development of surface and the drawing of simple machine parts.

4. **Design of Simple Structures.** Determination of stresses in simple structures, including the design of a simple truss in wood and steel. Especially adapted to the needs of carpenters, builders and contractors.

5. **Valve Gears.** A study of valve movements as applied to locomotives and other engines. The Zeuner diagram.

6. **Electrical Machinery.** Direct currents, a study of the construction and operation of direct current machinery.

7. **Electrical Machinery.** Alternating currents, a study of the construction and operation of alternating current machinery.

8. **Heat and Steam.** Nature of heat, use of steam table, efficiency of the perfect engine. compounding, jacketing, superheating.

9. **Internal Combustion Engines.** Gas, gasoline and producer gas engines, gas producers.

Organization of Instruction

A. The following four-years college courses, each leading to the degree of Bachelor of Science, are offered:

1.—College of Agriculture.

(a) Agronomy.
(b) Animal Husbandry.
(c) Dairy Husbandry.
(d) Horticulture.

2.—College of Engineering.

(a) Architectural Engineering.
(b) Chemical Engineering.
(c) Civil Engineering.
(d) Electrical Engineering.
(e) Irrigation Engineering.
(f) Mechanical Engineering.

3.—College of Applied Science.

(a) Botany and Bacteriology.
(b) Chemistry.
(c) Entomology and Zoology.
(d) Industrial Chemistry.

4.—College of Household and Industrial Arts.

(a) Applied Art.
(b) Home Economics.
(c) Secretarial Work.

5.—Courses in Vocational Education.

(a) Agricultural Education and Extension Methods.
(b) Home Economics Vocational Training.
(c) Trades and Industry.

B. The following courses, not leading to a Bachelor's Degree, are offered:

(a) School of Agriculture.
(b) School of Mechanic Arts.
(c) School of Home Economics.
(d) Secretarial Work.
(e) Course for Nurses.

College of Agriculture

This college includes four courses, Agronomy, Animal Husbandry, Dairy Husbandry, and Horticulture. For the first two years the work is the same in all courses.

The agricultural course is based on the assumption that the students are familiar with the manual operations of farm work. All students should have at least one year's farm experience before entering the course. In any case, students must furnish satisfactory evidence of having spent six months in practical work on a farm before graduation.

The college is very completely equipped for agricultural instruction. A large agricultural building, which centralizes the work, a one-thousand acre farm, a large orchard and garden, large and well equipped laboratories for the study of soils and crops, for milk testing and dairy manufacturing and for the study of farm machinery, a large greenhouse well stocked with plants, and several barns and other buildings filled with various breeds of livestock, including beef and dairy cattle, horses, sheep, hogs and poultry—all these are at the command of the agricultural student.

COURSE IN AGRICULTURE.

FRESHMAN YEAR	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Trigonometry and Logarithms (Math. 8) or			
Elementary Analysis (Math. 7)	4		
Livestock Judging (An. Husb. 1)	3		
History of Agriculture (Agron. 12)	2		
General Botany (Bot. 1)		6	
Livestock Judging (An. Husb. 1a)		3	
Agricultural Physics (Phys. 1a)			6
Principles of Plant Production (Hort. 1)			5
Farm Dairying (Dairy 1)			4
Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR.			
Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Organic Chemistry (Chem. 5)	6		
Invertebrate Zoology (Zool. 1)	6		
Field Crops (Agron. 1)	4		
Agricultural Chemistry (Chem. 7)		6	
Fruit Growing and Gardening (Hort. 10)		5	
Forage Crops (Agron. 11)		5	
Veterinary Physiology and Anatomy (Vet. Sci. 51) or			
Economic Entomology (Ento. 4)			5
Forage Crops (Agron. 11)			4
Elective			7
Military Science (Mil. Sci. 2)	1	1	1

COURSE IN AGRONOMY.

JUNIOR YEAR.

	Autumn	Winter	Spring
Economics (Econ. 3)	3	3	
Soil Physics (Agron. 2)	4	3	
Soil Fertility (Agron. 3)		4	
Soil Management (Agron. 8)			3
Elective	12	9	16

SENIOR YEAR

Farm Management (Agron. 6)	6		
Principles of Breeding (Agron. 7)	6		
Farm Records and Accounts (Agron. 10)	3		
Farm Mechanics (Agron. 4)		5	
Advanced Grain Judging (Agron. 5)			3
Elective	4	14	16

Note—Students will be required to choose not less than fifteen quarter credits from additional courses offered in the College of Agriculture, and not less than twenty-four quarter credits from courses offered in the College of Applied Science.

COURSE IN ANIMAL HUSBANDRY.

JUNIOR YEAR.

	Autumn	Winter	Spring
Nutrition of Farm Animals (An. Husb. 4)	5		
Economics (Econ. 3)	3	3	
General Bacteriology (Bact. 12)	6		
Poultry Management (Poult. 41)		4	
Breeds of Livestock (An. Husb. 2)		5	
Breeds of Livestock (An. Husb. 2a)			4
Handling and Fitting Livestock (An. Husb. 11)			2
Common Diseases (Vet. Sci. 57)			5
Elective	5	7	8

SENIOR YEAR.

Advanced Stock Judging (An. Husb. 3)	2		
Experimental Feeding (An. Husb. 9)	3		
Principles of Breeding (Agron. 7)	6		
Beef Cattle and Sheep Production (An. Husb. 7)		5	
Sanitary Science (Vet. Sci. 56)		3	
Horse, Swine and Dairy Production (An. Husb. 8)			5
Breeding Farm Animals (An. Husb. 6)			4
Obstetrics (Vet. Sci. 54)			3
Elective	8	11	7

Note—In the junior and senior years rules for electives are: 16 quarter credits required in the College of Agriculture and 12 quarter credits required in the College of Applied Science.

COURSE IN DAIRY HUSBANDRY.

JUNIOR YEAR.

	Autumn	Winter	Spring
Inspection of Milk Products (Dairy 2)	3		
Advanced Judging and Extension (Dairy 9)	3		
General Bacteriology (Bact. 12)	6		
Economics (Econ. 3)	3	3	
Market Milk (Dairy 5)		5	
Breeds of Live Stock (An. Husb. 2)		5	
Creamery Buttermaking (Dairy 3)			6
Breeds of Live Stock (An. Husb. 2a)			4
Elective	4	6	9

SENIOR YEAR.

Cheesemaking (Dairy 4)	6		
Milk Production (Dairy 7)	4		
Dairy Management (Dairy 6)		3	
Sanitary Science (Vet. Sci. 56)		3	
Factory Managemtnt (Dairy 8)			5
Dairy Technology (Dairy 10)			4
Elective	9	13	10

Note—Students will be required to choose not less than 15 quarter credits offered in the College of Agriculture and not less than 24 quarter credits in the College of Applied Science.

COURSE IN HORTICULTURE.

JUNIOR YEAR.

	Autumn	Winter	Spring
Economics (Econ. 3)	3	3	
Systematic Pomology (Hort. 4)	4		
Soil Physics (Agron. 2)	4		
Commercial Vegetable Gardening (Hort. 11)		5	
Soil Physics (Agron. 2)		3	
Organic Evolution (Zool. 9)			4
Elective	8	8	15

SENIOR YEAR.

Landscape Gardening (Hort. 6)	4		
Principles of Breeding (Agron. 7)	6		
Greenhouse Construction and Management (Hort. 5)		4	
Commercial Fruit Growing (Hort. 7)			5
Elective	9	15	14

Note—Students will be expected to elect at least two quarter credits in the College of Applied Science.

COURSES OF INSTRUCTION.

Note—Animal husbandry and dairy husbandry students will take veterinary anatomy and physiology (Vet. Sci. 51), and agronomy and horticultural students will take entomology (Ento. 4).

AGRONOMY.

PROFESSORS, A. ATKINSON, F. B. LINFIELD (Dean). ASSISTANT PROFESSORS, W. O. WHITCOMB, E. L. CURRIER, H. E. MURDOCK, L. F. GIESEKER.

The agronomy course is designed to afford special training in the production of field crops, the cultivation of soils, the maintenence of soil fertility, the management of farms, and the use of machinery and power for doing the work on the farm. The aim in this work is to fit men to intelligently deal with the many problems arising in the development of western agriculture under dry land and irrigated conditions.

The facilities provided for agronomy instruction include suitably equipped crops and soil laboratories, the crops and materials of the college farm and experimental fields and of the State Grain Laboratory, farm management survey records of over one thousand farms in Montana which represent different systems of management and an equipment of engines, tillage, seeding and harvesting machinery especially provided for instructional purposes.

1. Field Crops. 1 Q. Autumn. 4 cr. Prerequisite Botany 1. Fee $1; Deposit $1. Mr. Whitcomb.

History, characteristics, uses and methods of growing and handling wheat, oats, barley, corn, flax, and other cereals; judging of grain and use of the grain score card. Lect. 3; lab. 1.

2. Soil Physics. 2 Q. Autumn and winter. 7 cr. Prerequisites Physics 1a, Chemistry 5. Fee $1. Mr. Whitcomb, Mr. Gieseker.

Soil and its cultivation in relation to growth of crops; origin and formation of soils; soil classification and influence of tillage methods of soil moisture, texture, temperature and aeration. Lect. 2; lab. 2. Lect. 2; lab. 1.

3. Soil Fertility. 1 Q. Winter. 4 cr. Prerequisites Chemistry 7, Bacteriology 12. Mr. Gieseker.

Maintenance of fertility; use of fertilizers and crop rotations and their influence on the productive capacity of the soil. Lect. 4.

4. Farm Mechanics. 1 Q. Winter. 5 cr. Prerequisites Physics 1a, Agronomy 1, 2. Mr. Murdock.

Development, construction, functions and methods of operating, adjusting and repairing implements, farm machinery, farm motors and farm power. Lect. 3; lab. 2.

5. Advanced Grain Judging. 1 Q. Spring. 3 cr. Prerequisite Agronomy 1. Fee $1. Mr. Whitcomb.

Study of cereal, grass and forage seeds with practice judging. Commercial grading of grain. Lab. 3.

6. Farm Management. 1 Q. Autumn. 6 cr. Prerequisites Agronomy 1, 2. Mr. Currier.

In this course are taught the fundamental principles involved in the efficient organization and management of a farm business. Lect. 4; Lab. 2.

7. Principles of Breeding. 1 Q. Autumn. 6 cr. Prerequisite Zoology 1. Mr. Atkinson.

Variation, biometry, heredity, selection, mutations hybridization, reversion and prepotency as applied to plants and animals; methods used in improvement of plants. Lect. 6.

8. Soil Management. 1 Q. Spring. 3 cr. Prerequisites Agronomy 1, 2. Mr. Whitcomb.

Methods of handling alkali, gumbo, sandy, heavy clay, muck, peat and worn-out soils; soil problems of irrigated and dry farms. Lect. 3.

9. Thesis. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Atkinson.

Senior agronomy students may prepare a thesis on some subject approved by the head of the department not later than November 15.

10. Farm Records and Accounts. 1 Q. Autumn. 3 cr. Mr. Currier.

Keeping and interpreting farm accounts. Open to juniors and seniors in the College of Agriculture. Lect. 1; lab. 2.

11. Forage Crops. 2 Q. Winter and spring. 9 cr. Prerequisite Agronomy 1. Fee $1; Deposit $1. Mr. Whitcomb.

History, characteristics and methods of management of grasses, clovers and other crops where the entire plant is cut for hay or used for silage, pasturage or soiling. Lect. 3; lab. 2. Lect. 2; lab. 2.

12. History of Agriculture. 1 Q. Autumn. 2 cr. Mr. Linfield. Lect. 2.

ANIMAL HUSBANDRY.

Professor, C. N. Arnett, Assistant Professors, R. C. McChord, W. E. Joseph, Mr. Tretsven.

The course in animal husbandry covers the various phases of live stock production, such as judging, selection, breeding, feeding, care and management for both farm and range conditions.

The aim is to give the student a thorough training in practical and scientific live stock production. The work in judging begins with score card practice and leads to judging groups. Feeding is based upon scientific principles and made as practical as possible.

Study of pedigrees and breeding records gives a knowledge of the most desirable families or strains within the different breeds and points the way to livestock improvement.

This course aims to give a scientific and practical training that fits the student for work in practical and scientific stock farming, also work in teaching and research work in animal husbandry in the various fields.

The department of animal husbandry in the college and experiment station maintains a number of the leading breeds of live stock for use in the class room. This equipment consists of several types of horses; Hereford, Shorthorn, Holstein, and Jersey cattle; Berkshire, Poland China, Duroc Jersey swine; Cotswold, Shropshire and Rambouillet sheep; and several of the leading breeds and types of poultry.

The experiment station also maintains a large number of high grade animals for experimental work that are available for study and offer many practical demonstrations in feeding and management.

The equipment of barns, silos, etc., is of modern plan and construction and affords an excellent opportunity for study.

1. **Live Stock Judging.** 1 Q. Autumn. 3 cr. Fee $1. Mr. McChord.

Beef cattle and sheep. Scoring individuals, judging groups, study of live stock markets and market classification. Lab. 3.

1a. **Live Stock Judging.** 1 Q. Winter. 3 cr. Fee $1. Mr. McChord.

Horses, swine, and dairy cattle. Scoring individuals, judging groups, study of live stock markets and market classification. Lab. 3.

2. **Breeds of Live Stock.** 1 Q. Winter. 5 cr. Prerequisite Animal Husbandry 1. Fee $1. Mr. McChord.

Origin, history, characteristics and adaptability of beef cattle and sheep; judging breed type. Lect. 3; lab. 1.

2a. **Breeds of Live Stock.** 1 Q. Spring 4 cr. Prerequisite Animal Husbandry 1a. Fee $1. Mr. McChord.

Origin, history, characteristics and adaptability of horses, swine, and dairy cattle; judging breed type. Lect. 4; lab. 1.

3. **Advanced Stock Judging.** 1 Q. Autumn. 2 cr. Prerequisites Animal Husbandry 2, 2a. Fee $1. Mr. McChord.

Continuation of judging and study of market and breeding stock. Beef cattle, sheep, horses, swine and dairy cattle. Lab. 2.

4. **Nutrition of Farm Animals.** 1 Q. Autumn. 5 cr. Prerequisite Chemistry 5. Mr. Joseph.

Digestion, metabolism, enzyme changes, functions of nutrients, compounding rations, feeding standards, feeds, their uses and adaptability in the ration. Lect. 5.

6. **Breeding Farm Animals.** 1 Q. Spring. 4 cr. Prerequisites Animal Husbandry 2, 2a, Agronomy 7. Fee $1. Mr. McChord.

Principles and practices of breeding farm animals, tabulation and study of pedigrees. Lect. 3, lab. 1.

7. Beef Cattle and Sheep. 1 Q. Winter. 4 or 5 cr. Prerequisite Animal Husbandry 4. Mr. Arnett, Mr. McChord.

Feeding, care and management of pure bred and grade beef cattle and sheep. Lect. 4; or Lect. 4; lab. 1.

8. Horses, Swine and Dairy Cattle Production. 1 Q. Spring. 4 or 5 cr. Prerequisite Animal Husbandry 4. Mr. Arnett, Mr. McChord.

Feeding, care and management of pure bred and grade horses, swine and dairy cattle. Lect. 4; or Lect. 4; lab. 1.

9. Experimental Feeding. 1 Q. Autumn. 3 cr. Prerequisites Animal Husbandry 4, 7. Mr. Arnett, Mr. Joseph.

Methods, principles and results of experimental work in Animal Husbandry. Lect. 2; lab. 1.

10. Thesis. 1 Q. Autumn or winter or spring. 3 cr. Mr. Arnett.

Animal Husbandry students may elect thesis work during the senior year.

11. Handling and Fitting Live Stock. 1 Q. Spring. 2 cr. Fee $2. Mr. McChord, Mr. Tretsven.

Fitting and handling live stock for show, sale, breeding and work. Lab. 2.

DAIRY HUSBANDRY.

PROFESSOR, G. L. MARTIN.

The course in dairy husbandry embraces both the productive and the manufacturing features of the dairy industry. The first two years are given largely to a study of the general and the agricultural sciences with the view of preparing the student for their economic application to practical dairy problems.

The productive phase of the work includes the management of the dairy herd, handling of milk on the farm, transportation, distribution, inspection and marketing of milk. The manufacturing phase deals with the more technical work in separation, testing and preparation of dairy products, factory management, exhibiting, judging and marketing.

This course is designed to fit the student for the rapidly growing demand for men trained in practical, modern dairy science. The positions open are financially attractive, and offer splendid opportunities for rapid advancement, especially as pertains to college, experiment station and educational lines. Of no less importance is the commercial side which deals with milk production, farm, factory, and corporation management; farm, factory, and municipal inspection; dairy manufactures and marketing.

1. **Farm Dairying.** 1 Q. Spring. 4 cr. Fee $2; Deposit $.50.

Development of the dairy industry, selection of the dairy farm, the cow, the sire, and building up the dairy herd. Secretion, composition, and testing of milk and cream. Care of milk on the farm, operation of hand separators, ripening cream, making butter and marketing dairy products. Lect. 3; lab. 1.

2. **Inspection of Milk Products.** 1 Q. Autumn. 3 cr. Prerequisites Dairy 1, Chemistry 2. Fee $2; Deposit $.50.

Methods of inspection, scoring stables, dairies, milk depots, factories and markets; composition of milk products in relation to standards of purity. Lect. 2; lab. 1.

3. **Creamery Butter Making.** 1 Q. Spring. 6 cr. Prerequisite Dairy 1.

Handling cream and making butter on a commercial scale, practice in pasteurizing; making starters; ripening cream, churning, packing and storage of butter. Lect. 3; lab. 3.

4. **Cheese Making.** 1 Q. Autumn. 6 cr.

Modern methods of making cheddar cheese adapted to farm and factory practice. Lect. 3; lab. 3.

5. **Market Milk.** 1 Q. Winter. 5 cr.

Relation of the milk supply to producer, distributor, and consumer. Grading and pasteurizing, standardizing, certifying, modifying, bottling, and distributing of milk. Lect. 4; lab. 1.

6. **Dairy Management.** 1 Q. Winter. 3 cr. Prerequisite Dairy 1.

Organization and management of different systems of dairy farms and study of factors in the cost of producing milk. Planning and equipping of barns, silos, stalls, milk rooms, and ice houses. Lect. 2; lab. 1.

7. **Milk Production.** 1 Q. Autumn. 4 cr. Prerequisite Dairy 1.

A study of the milk producing ability of dairy breeds, and of the factors influencing a persistent milk flow as breeding, feeding, and care of the herd. Lect. 3; lab. 1

8. **Factory Management.** 1 Q. Spring. 4 cr. Prerequisites Dairy 3, 4.

Organization, location, planning, construction and equipping of factories, handling by-products, preparation of exhibits, scoring, marketing and keeping dairy accounts. Lect. 2; lab. 2.

9. **Advanced Judging and Extension.** 1 Q. Autumn. 3 cr. Prerequisites Dairy 1, Animal Husbandry 1a.

The advanced judging of dairy cattle which will include trips to dairy farms and other practice work. Handling exhibits of dairy cattle, organization of cooperative cow testing associations, breeding associations, calf clubs and official registry of cows.

10. **Dairy Technology.** 1 Q. Spring. 4 cr.

Composition, manufacture and utilization of dairy products and by-products as applied in domestic and commercial arts. Lect. 3; lab. 1.

HORTICULTURE.

PROFESSOR, O. B. WHIPPLE. ASSISTANT PROFESSOR, C. C. STARRING.

The four years' course in horticulture, leading to the degree of Bachelor of Science in horticulture, is designed to prepare students as teachers in agricultural colleges, investigators in the agricultural experiment stations, editors of horticultural papers, managers of fruit associations and superintendents of commercial orchards and fruit plantations. The Western United States leads the world in methods of orcharding and disposing of orchard products, and there is a strong and growing demand for persons properly trained to manage the orchard projects now operated throughout the fruit regions of the West. Fruit growing, when done in a scientific way is extremely profitable and presents an inviting field for the trained horticulturist. The college offers good facilities for a thorough training in all branches of horticulture.

1. Principles of Plant Production. 1 Q. Spring. 5 cr. Prerequisite Botany 1. Fee $1.50; Deposit $1. Mr. Whipple.

Propagation of plants by spores, seeds, cuttings, layers, graftage, methods of gathering and storing seeds; transplanting. Lect. 3; lab. 2.

4. Systematic Pomology. 1 Q. Autumn. 4 cr. Prerequisites Horticulture 1, Botany 1. Fee $5. Mr. Starring.

Description and naming of varieties of fruit. Judging of exhibition fruit and discussion of score cards. Evolution of cultivated plants, especially fruits. Lect. 2; Lab. 2.

5. Greenhouse Construction and Management. 1 Q. Winter. 4 cr. Prerequisites Horticulture 1, Agronomy 2, 3. Mr. Whipple.

Construction, heating and maintaining of greenhouses; growing plants in greenhouses and conservatories. Lect. 4.

6. Landscape Gardening. 1 Q. Autumn. 4 cr. Fee $1. Mr. Starring.

Laying out and planting of private and public grounds are discussed. Trees, shrubs, and flowers suited to Montana conditions are studied. Lect. 2; Lab. 2.

7. Commercial Fruit Growing. 1 Q. Spring. 5 cr. Prerequisites Horticulture 1, 4, Agronomy 2, 3. Mr. Whipple.

Planting, cultivating, irrigating and managing commercial orchards. Methods of picking, grading, packing, and marketing fruits. Lect. 4; Lab. 1.

8. Thesis, Credits variable. Mr. Whipple.

Horticultural students may elect to prepare during the senior year a thesis, the subject of which must be approved by the head of the department of horticulture.

10. Fruit Growing and Gardening. 1 Q. Winter. 5 cr. Prerequisite Horticulture 1. Mr. Whipple, Mr. Starring.

Principles of orcharding and gardening, with special reference to their bearing upon home orcharding and home gardening. Lect. 5.

11. Commercial Vegetable Growing. 1 Q. Winter. 5 cr. Prerequisite Horticulture 1. Mr. Whipple, Mr. Starring.

Organization and management of market and truck gardens; special problems connected with growing vegetables on a large scale. Preparation of vegetables for market; methods of marketing, storage of vegetables. Lect. 4; lab. 1.

POULTRY HUSBANDRY.

PROFESSOR, W. F. SCHOPPE.

41. Poultry Management. 1 Q. Winter. 4 cr.

Types and breeds of poultry, fancy and utility classification of fowls, principles of breeding, housing, feeding, incubation, and brooding, preparation for and marketing of poultry products. Lect. 3; lab. 1.

42. Poultry Breeds. 1 Q. Autumn. 6 cr.

Origin and development of the more important breeds of poultry, breeding fancy poultry. Preparation of birds for show. Judging by score card and comparison. Lect. 3; lab. 3.

43. Incubation and Brooding. 1 Q. Spring. 4 cr.

Operating incubators, testing eggs, keeping records, operating brooders, care and feeding of chicks. Lect. 2; lab. 2.

44. Poultry Houses. 1 Q. Autumn. 6 cr.

Planning, arranging, and designing poultry houses. Lect. 4; lab. 2.

45. Poultry Feeds and Feeding. 1 Q. Autumn. 4 cr.

Feeds suited to poultry, grain mixture, etc., feeding for egg production and fattening stock for market. Lect. 2; lab. 2.

46. Marketing Poultry Products. 1 Q. Autumn. 4 cr. Fee $1.

Preparation of poultry and eggs for market, storage preservation, principles of marketing, killing, picking, and packing poultry. Drawing, boning and trussing fowls for special market. Candling, grading, and packing eggs. Lect. 3; lab. 1.

47. Advanced Poultry Breeding. 1 Q. Winter. 4 cr. Prerequisites Agronomy 7, Poultry 42.

Breeding birds for show purposes; judging birds, selection and mating of birds for fancy and utility purposes. Lect. 3; lab. 1.

48. Poultry Culture. 1 Q. Winter. 3 cr. Fee $1.

Breeds of poultry, their care, housing and feeding. Preparation, grading and packing poultry for market. Methods of marketing. Cold storage poultry. Selection of poultry for the table, drawing, trussing and boning. Candling, grading, and packing eggs for market. Methods of marketing. Preserving eggs for future consumption, methods of storage and means of detecting storage eggs. Elective for Junior and Senior students in Home Economics. Lect. 2; lab. 1.

VETERINARY SCIENCE.

PROFESSOR, H. WELCH.

51. Veterinary Physiology and Anatomy. 1 Q. Winter. 5 cr. Fee $2.

Physiology of domestic animals, dealing with digestion and assimilation of foods, the circulation and functions of the blood, the nervous system and organs of special sense, and muscles and phenomena of locomotion. Lect. 4; lab. 1.

53. Pathology. 1 Q. Autumn. 3 cr. Prerequisite Veterinary Science 51.

Study of normal and pathological tissues. Gross and microscopical specimens will be used for demonstration. Lect. 1; lab. 2.

54. Obstetrics. 1 Q. Winter. 3 cr. Prerequisite Veterinary Science 51.

Diseases of domestic animals incident to reproduction. Normal parturition, dystokia, and care of the newborn; illustrated by clinic cases. Lect. 2.

56. Sanitary Science. 1 Q. Autumn. 3 cr. Prerequisite Veterinary Science 57 or Bacteriology 12.

Care and handling of farm animals affected with contagious and infectious diseases. Methods of diagnosis, treatment, quarantine and general preventative measures. Lect. 2.

57. Common Diseases of Animals. 1 Q. Winter. 5 cr. Prerequisite Veterinary Science 51 or Bacteriology 12.

Diagnosis and first aid treatment of the more common ailments of live stock. Farm sanitation and general measures for disease prevention. Illustrated by clinic cases. Lect. 4.

College of Engineering

The rapid development of the State of Montana makes the profession of engineering one of great importance. The development of our natural resources will require the services of engineers with specialized training. At no time has there been so great a demand for engineers as now, and the indications are that this demand will continue for years to come. The College of Engineering has grown rapidly during the past few years.

All engineering courses supported by the state, except the course in mining engineering at the School of Mines at Butte, are concentrated in the State College at Bozeman. As a result of this concentration of effort, the best possible instruction is provided by the State.

COURSE IN ARCHITECTURAL ENGINEERING

FRESHMAN YEAR	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Engineering Mathematics (Math. 1)	5		
Mechanical Drawing (M. E. 1)	4		
Engineering Mathematics (Math. 2)		6	
Descriptive Geometry (M. E. 3)		3	4
Engineering Mathematics (Math. 3)			6
Architectural Drawing (Art 3)			4
Mifitary Science (Mil. Sci. 1)	1	1	1
SOPHOMORE YEAR.			
Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Engineering Mathematics (Math. 4)	6		
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Engineering Mathematics (Math. 5)		6	
Architectural Drawing (Art 3a)	3	3	2
Building Sanitation (A. E. 5)	2		
Elementary Design (A. E. 4)		2	
Theoretical Mechanics (C. E. 5)			6
Working Drawings (A. E. 1)			3
Military Science (Mil. Sci. 2)	1	1	1
JUNIOR YEAR.			
Economics (Econ. 3)	3	3	
Mechanics of Materials (C. E. 6)	5		
Strength of Materials (C. E. 8)	1		
Graphic Statics (C. E. 28)	3		
History of Architecture (A. E. 2)	3	3	
History of Architecture (A. E. 3)			3
Roofs and Bridges (C. E. 29)		4	
Masonry Construction (A. E. 14)		4	
Specifications and Working Drawings (A. E. 6)		3	
Engineering Economics (C. E. 45)			4
Hydraulics (C. E. 43)			2
Estimating (A. E. 8)			3
Specifications and Working Drawings (A. E. 7)			3
Elective	4	2	4
SENIOR YEAR.			
Steam and Gas (M. E. 7)	3		
Bridge Design (C. E. 30)	5		
Architectural Engineereing (A. E. 15)	4		
Decoration (A. E. 10)	3		
Electric Power (E. E. 14)		4	
Architectural Engineering (A. E. 16)		4	
Illumination (E. E. 19)		3	
Heat and Ventilation (M. E. 24)			3
Contracts and Specifications (C. E. 23)			2
Steel Mill Buildings (A. E. 11)		3	
Concrete Construction (C. E. 32)			4
Cement and Concrete (C. E. 34)		2	
Foundations and Masonry (C. E. 21)			4
Thesis (A. E. 12)			5
Elective	4	3	2

COURSE IN CHEMICAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Engineering Mathematics (Math. 1)	5		
Engineering Mathematics (Math. 2)		6	
Engineering Mathematics (Math. 3)			6
Mechanical Drawing M. E.(1)	2		
Shop Work (M. E. 2)	2		
Descriptive Geometry (M. E. 3)		3	
Machine Work (M. E. 9)			4
Descriptive Geometry (M. E. 3)			4
Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Engineering Mathematics (Math. 4)	6		
Engineering Mathematics (Math. 5)		6	
Theoretical Mechanics (C. E. 5)			6
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Quantitative Analysis (Chem. 3)	5	5	5
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Quantitative Analysis (Chem. 4)	5		
Physical Chemistry (Chem. 19)		5	
Sound and Light (Phys. 3)			3
Mechanics of Materials (C. E. 6)	5		
Mechanism (M. E. 8)		3	3
Physical Measurements (Phys. 4)			2
Strength of Materials (C. E. 8)	1		
Thermodynamics (M. E. 18)	5	5	
Physical Chemistry (Chem. 19)			5
Mechanism (M. E. 5)	3		
Electric Power (E. E. 14)		4	
Fuel Analysis (Chem. 17)			3
Mechanical Laboratory (M. E. 15a)		2	
Elective			3

SENIOR YEAR

Economics (Econ. 3)	3	3	
Organic Chemistry (Chem. 9)	5	5	5
Industrial Chemistry (Chem. 14)	5	5	5
Seminar (Chem. 20)	1	1	1
Elective	5	5	8

COURSE IN CIVIL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Engineering Mathematics (Math. 1)	5		
Engineering Mathematics (Math. 2)		6	
Engineering Mathematics (Math. 3)			6
Mechanical Drawing (M. E. 1)	4		
Descriptive Geometry (M. E. 3)		3	4
Land Surveying (C. E. 1)			4
Military Science (Mil. Sci. 1)	1	1	1

Note—Fourth quarter. Summer school in surveying (C. E. 4a) six weeks.

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Engineering Mathematics (Math. 4)	6		
Engineering Mathematics (Math. 5)		6	
Theoretical Mechanics (C. E. 5)			6
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Plane Surveying (C. E. 2)	3	3	
Steam and Gas (M. E. 7)	2		
Mechanical Laboratory (M. E. 15a)		2	
Railroad Engineering (C. E. 4)			5
Military Science (Mil. Sci. 2)	1	1	1

Note—Fourth quarter. Summer school in surveying (C. E. 4b) six weeks.

JUNIOR YEAR.

Economics (Econ. 3)	3	3	
Mechanics of Materials (C. E. 6)	5		
Hydraulics (C. E. 37)		4	
Engineering Economics (C. E. 45)			4
Strength of Materials (C. E. 8)	1		
Roofs and Bridges (C. E. 29)		4	
Hydraulic Engineering (C. E. 15)		4	4
Graphic Statics (C. E. 28)	3		
Railroad Engineering (C. E. 9)	3		
Astronomy (Math. 6)			3
Least Squares (Math. 12)			3
Engineering Chemistry (Chem. 12)	4		
Geology (Geol. 1)		4	
Highway Engineering (C. E. 7)			3
Hydraulic Laboratory (C. E. 38)			1

SENIOR YEAR.

Irrigation Engineering (C. E. 36)	4		
Sanitary Engineering (C. E. 14)		4	
Concrete Design (C. E. 32)			4
Bridge Design (C. E. 31)		3	
Foundation and Masonry (C. E. 21)			4
Bridge Design (C. E. 30)	5		
Municipal Engineering (C. E. 3)	3		
Electric Power (E. E. 14)		4	
Geodesy (C. E. 17)	3		
Contracts and Specifications (C. E. 23)			2
Cement Laboratory (C. E. 34)		2	
Seminar (C. E. 12)			1
Highway Engineering (C. E. 35)		3	
Thesis (C. E. 27)			5
Elective	4	3	3

COURSE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Engineering Mathematics (Math. 1)	5		
Engineering Mathematics (Math. 2)		6	
Engineering Mathematics (Math. 3)			6
Mechanical Drawing (M. E. 1)	2		
Descriptive Geometry (M. E. 3)		3	4
Shop Work (M. E. 2)	2		
Machine Work (M. E. 9)			4
Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Engineering Mathematics (Math. 4)	6		
Engineering Mathematics (Math. 5)		6	
Theoretical Mechanics (C. E. 5)			6
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Electrical Machinery (E. E. 1)	3		
Electrical Diagrams (E. E. 7)	2	3	3
Surveying (C. E. 1a)		2	2
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Mechanics (C. E. 6)	5		
Dynamos and Motors (E. E. 3)	3	3	
Electricity and Magnetism (Phys. 5)	3	3	
Engineering Economics (C. E. 45)			4
Applied Electricty (E. E. 5)			4
Dynamo Design (E. E. 8)	2	2	3
Heat Power (M. E. 18a)			3
Steam and Gas (M. E. 7)		3	
Strength of Materials (C. E. 8)	1		
Seminar (E. E. 17)	1	1	1
Electrical Laboratory (E. E. 4)		2	3
Mechanical Laboratory (M. E. 15a)		2	

SENIOR YEAR

Alternating Currents (E. E. 9)	4	4	4
Electrical Design (E. E. 13)	3	3	3
Electrical Laboratory (E. E. 10)	3	3	2
Thesis (E. E. 20)	3	3	3
Contracts and Specifications (C. E. 23)			2
Seminar (E. E. 17)	1	1	1
Elective	4	4	3

COURSE IN IRRIGATION ENGINEERING

The following tabulation is an outline of a course of study for students who desire to specialize in Irrigation Engineering. The work of the freshman and sophomore years is the same as that required of the regular Civil Engineering students.

JUNIOR YEAR	Autumn	Winter	Spring
Organic Chemistry (Chem. 5)	6		
Hydraulics (C. E. 37)		4	
Hydraulic Laboratory (C. E. 38)			1
Mechanics of Materials (C. E. 6)	5		
Hydraulic Engineering (C. E. 15)		4	4
Concrete Design (C. E. 32)			4
Strength of Materials (C. E. 8)	1		
Graphic Statics (C. E. 28)	3		
Roofs and Bridges (C. E. 29)		4	
Irrigation Engineering (C. E. 36)	4		
General Botany (Bot. 1)		6	
Irrigation Engineering (C. E. 40)			5
Pumping for Irrigation (C. E. 42)			5

SENIOR YEAR			
Steam and Gas (M. E. 7)	2		
Mechanical Laboratory (M. E. 15a)		2	
Canal Management (C. E. 41)			5
Field Crops (Agron. 1)	4		
Electrical Power (E. E. 14)		4	
Soil Physics (Agron. 2)	4	3	
Forage Crops (Agron. 11)		5	4
Farm Management (Agron. 6)	6		
Cement Laboratory (C. E. 34)		2	
Contracts and Specifications (C. E. 23)			2
Canal Surveying (C. E. 39)	3		
Thesis (C. E. 27)			5
Elective		3	3

COURSE IN MECHANICAL ENGINEERING

	Autumn	Winter	Spring
FRESHMAN YEAR			
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Engineering Mathematics (Math. 1)	5		
Engineering Mathematics (Math. 2)		6	
Engineering Mathematics (Math. 3)			6
Mechanical Drawing (M. E. 1)	2		
Descriptive Geometry (M. E. 3)		3	4
Shop Work (M. E. 2)	2		
Machine Work (M. E. 9)			4
Military Science (Mil. Sci. 1)	1	1	1
SOPHOMORE YEAR			
Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Engineering Mathematics (Math. 4)	6		
Engineering Mathematics (Math. 5)		6	
Theoretical Mechanics (C. E. 5)			6
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Mechanism (M. E. 5)	3		
Mechanism (M. E. 8)		3	3
Machine Work (M. E. 21)	2		
Foundry (M. E. 4)		2	
Pattern Work (M. E. 2a)			2
Military Science (Mil. Sci. 2)	1	1	1
JUNIOR YEAR			
Economics (Econ. 3)	3	3	
Engineering Economics (C. E. 45)			4
Mechanics of Materials (C. E. 6)	5		
Electrical Power (E. E. 14)		4	
Electrical Power (E. E. 14a)			4
Thermodynamics (M. E. 18)	5	5	2
Machine Design (M. E. 13)		3	3
Mechanical Laboratory (M. E. 15)	3		
Mechanical Laboratory (M. E. 20)		2	2
Heat and Power (M. E. 24)			2
Machine Work (M. E. 21)	2		
Strength of Materials (C. E. 8)	1		
Machine Tool Work (M. E. 27)		2	2
SENIOR YEAR.			
Gas Power Engineering (M. E. 22)	4		
Mechanical Engineering of Steam Power Plants (M. E. 26)		4	
Plant Design (M. E. 29)			3
Engine and Turbine Design (M. E. 23)	4	4	
Commercial Engineering (M. E. 25)			4
Mechanical Laboratory (M. E. 28)	2		
Hydraulics (C. E. 37)		4	
Hydraulic Laboratory ((C. E. 38)			2
Seminar (M. E. 11)	1	1	1
Contracts (C. E. 23)			2
Thesis (M. E. 30)	1	2	3
Elective	7	4	4

ARCHITECTURAL ENGINEERING.

PROFESSOR, W. R. PLEW.

The rapid increase of population in the State of Montana will result in a healthy growth of our cities and towns. Homes, factories, office buildings and public buildings will be erected.

In addition to the sciences which are common to all engineering courses, this course includes a thorough study of freehand drawing and the drawing of architectural designs. Ancient and modern architecture is studied in all its phases in order that the student may become acquainted with proper architectural forms. The construction of steel and concrete buildings, the sanitation of buildings, interior and exterior decoration, and illumination, form an important part of the instruction given.

The course is intended to provide the training which the student will need to prepare himself for work as an architectural engineer, building superintendent, contractor, or builder.

1. **Working Drawings.** 1 Q. Spring. 3 cr. Fee $1.

Detailing on a large scale, floors, windows, stairs, cornice, cabinet making and conventional methods in architectural drawing. Lab. 3.

2. **History of Architecture.** 2 Q. Autumn and winter. 6 cr.

History of architectural design from early Egyptian to Renaissance, illustrated by lantern slides. Lect. 2; lab. 1.

3. **History of Architecture.** 1 Q. Spring. 3 cr.

A continuation of the above, with special reference to modern times. Lect. 2; lab. 1.

4. **Elementary Design.** 1 Q. Winter. 2 cr. Fee $1.

Rendering of the orders and sketch problems involving simple composition. Lab. 2.

5. **Building Sanitation.** 1 Q. Autumn. 2 cr.

Design and installation of plumbing; removal of waste, sewage disposal, water supply and fixtures in dwellings and public buildings. Lect. 2.

6. **Specifications and Working Drawings.** 1 Q. Winter. 3 cr.

Plan and framing problems; ballon framing, detailing of walls, etc. Lab. 3.

7. **Specifications and Working Drawings.** 1 Q. Spring. 3 cr.

Masonry details, stereotomy, and building specifications. Lect. 3.

8. **Estimating.** 1 Q. Spring. 3 cr.

Estimating building costs. Lect. 3.

10. **Architectural Decoration.** 1 Q. Autumn. 3 cr. Fee $1.

Interior and exterior ornamental design and finish of buildings. Lab. 3.

11. **Steel Mill Building.** 1 Q. Winter. 3 cr. Prerequisites Civil Engineering, 28, 29. Fee $1.

Designs of trusses in framed bents; arches; mill building construction, slow burning and fire proof construction, specifications. Lab. 3.

12. **Thesis.** 1 Q. Spring. 5 cr.

13. **House Planning.** 1 Q. Winter. 1 cr.

For students in home economics. Lab. 1.

14. **Masonry Construction.** 1 Q. Winter. 4 cr. Fee $1.

The study of building stones and their preparation for use in the wall. Design of masonry construction with special reference to its use in building construction. Stereotomy. Lect. 3; lab. 1.

15. **Architectural Engineering.** 1 Q. Autumn. 4 cr. Prerequisites Civil Engineering 6, 29, concurrently with Civil Engineering 30. Fee $1.

Design of steel frame work in modern building construction. Lab. 4.

16. **Architectural Engineering.** 1 Q. Winter. 4 cr. Prerequisite Architectural Engineering 15. Fee $1.

Design of larger buildings, methods of construction fireproofing. Lab. 4.

CHEMICAL ENGINEERING.

PROFESSOR, W. M. COBLEIGH. INSTRUCTOR, E. C. HYTREE.

The chemical engineering course provides for a thorough training in this particular field of work, and deals with the application of chemistry and electro-chemistry to manufacture.

In the first two years the student is taught mathematics, English, drawing, general chemistry, physics, etc. These are followed in the junior and senior years by a thorough course in industrial processes, given by lectures, supplemented by laboratory instruction.

The work includes a thorough study of the manufacture of such materials as cements, glass, fertilizers, explosives, alkalies, acids, paints, sugar, paper, etc.

Special attention is given to heat and its application to industrial processes; to the manufacture of gases and the by-products of gas works.

The above work is supplemented by courses in electrical engineering, steam engineering, etc.

Inspection trips are taken to some of the larger industrial plants of Montana in order that the student may examine the work as actually done in manufacturing plants.

14. **Industrial Chemistry.** 3 Q. Autumn, winter, and spring. Continuous. 15 cr. Prerequisites Chemistry 2, 3, 9. Fee $4; Deposit $4. Mr. Cobleigh.

The application of chemistry to the industries, including the operations common to many chemical industries such as crushing, grinding,

calcination, fusion, distillation, crystallation, etc., and types of machinery used in these operations. Inspections and reports on various industrial plants in the state. Lect. 3; lab. 2.

17. Fuel Analysis. 1 Q. Spring. 3 cr. Prerequisite Chemistry 3. Fee $4; Deposit $4. Mr. Cobleigh.

Production and analysis of solid, liquid and gaseous fuels, illuminating gas, and lubricating oils. Lect. 1; lab. 2.

18. Water Analysis. 1 Q. Winter or spring. 4 cr. Prerequisites Chemistry 1, 3. Fee $4; Deposit $4. Mr. Cobleigh.

Chemical examination of potable waters, of water for industrial purposes and steam raising, of sewages, and of air. Water purification and softening, and sewage treatment. Lect. 2; lab. 2.

19. Physical Chemistry. 2 Q. Winter and spring. 10 cr. Prerequisite Chemistry 3. Fee $2; Deposit $2. Mr. Hytree.

Theoretical chemistry, including the following topics; stoichometry, the gas laws; kinetic theory of gases, radioactivity, the electron theory, colloids, osmotic pressure, the theory of solution, phase rule, equilibrium in electrolytes and electro chemistry. Lect. 3; lab. 2.

20. Seminar. 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Cobleigh, Mr., Mr. Hytree.

Each student will be required to make abstracts of articles on assigned subjects from the leading journals, and present them at weekly meetings of the students and department instructors where the topics are discussed. Lect. 1.

21. Thesis. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Cobleigh, Mr., Mr. Hytree.

Students in the chemical engineering course may in the senior year prepare a thesis on some subject which will involve considerable laboratory work and originality. Lab. 2.

CIVIL ENGINEERING

Professors, L. D. Conkling, W. R. Plew. Assistant Professor, F. C. Snow.

The civil engineering course is designed to give a broad education in the general and scientific subjects which are the foundation of all branches of technology, and special training in those subjects comprised under the term "Civil Engineering." The young men are taught how to think, and how to attack new problems; they are taught the underlying principles of engineering and inspired with a desire to do their best work. The graduate is prepared to enter upon the location and construction of railroads, public highways, bridges, water works, water power development, irrigation, sewerage systems, and sewage disposal, city and municipal engineering. He can with advantage take up allied work in mining, mechanical, electrical, or architectural engineering.

The freshman year is devoted to fundamental studies which give

both general culture and preparation for the technical work of the following years.

In the sophomore year the fundamental subjects of mathematics, English, physics, and chemistry are completed, and the technical subjects of civil engineering are begun. The theory of land surveying is taught by lectures, field work, and drawing room exercises. The study of the theory and principles of highway and railroad engineering is begun.

The junior year completes the work in theoretical and applied mechanics and railroad engineering. The technical subjects of hydraulic engineering, structures and bridges, theory and design, are begun. The course in economics begun in the autumn quarter of the junior year is continued for three quarters, and consists of the study of such subjects as land, capital, labor, coinage, banking, interest, wages, taxation, etc. The important economic questions of the present time are considered and discussed.

The senior year is devoted to municipal and sanitary engineering, plain and reinforced concrete construction, the design of typical bridges and buildings, with complete working drawings, bill of materials and estimate of cost.

Special work in irrigation engineering is offered as shown by the tabulation of courses in the department of civil engineering.

The course of study is the same as the regular civil engineering course for the freshman and sophomore years. In the junior and senior years the student in irrigation engineering is required to take courses in organic chemistry, general botany and agronomy, that he may become familiar with the different kinds of soils and the method of handling each; the different kinds of cereals and forage crops, and the methods of selection, planting and irrigation.

Special attention is also given to hydraulic engineering, as it is important that a student in irrigation engineering should be thoroughly familiar with rainfall, drainage area, storage of water and water power development.

1. Land Surveying. 1 Q. Spring. 4 cr. Prerequisite Mathematics 2. Fee $1; Deposit $2. Mr. Snow.

Theory, adjustment and use of instruments in land surveying, hydrography, water measurement, irrigation and drainage, plotting and mapping. Lect. 1; lab. 3.

1a. Surveying. 2 Q. Winter and spring. 4 cr. Prerequisite Mathematics 2. Fee $1; Deposit $2. Mr. Snow.

Theory, adjustment, and use of instruments in land surveying, hydrography, water measurement, irrigation and drainage, plotting and mapping, draughting and office work. Lab. 2.

2. Plane Surveying. 2 Q. Autumn and winter. 6 cr. Prerequisites Mathematics 2, Civil Engineering 1. Fee $1; Deposit $2. Mr. Snow.

Computation of areas, dividing of land, the methods of field, hydrographic, mine, and city surveying, barometric and spirit leveling, computation of earth work; map drawing and topographic signs; field work with transit level, and plane table; map drawing from students' field notes. Lab. 3.

3. Municipal Engineering. 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 2. Mr. Conkling.

City planning, alloting and platting additions; construction of streets, sidewalks, curbs, gutters, and parkings; disposal of refuse; city parks and their paths, walks, and roadways; law affecting the work of the city engineer. Lect. 3.

4 Railroad Engineering. 1 Q. Spring. 5 cr. Prerequisite Civil Engineering 2. Fee $1; Deposit $2. Mr. Snow.

Railroad reconnoisance, preliminary and location surveys. Railroad structures, simple and compound curves, easement curves and transition spirals, simple and compensated grades, switches, turnouts and crossings. Lect. 1; lab. 4.

4a. Summer School in Railroad Engineering. 2 cr. Mr. Snow.

Required of all freshmen civil engineering students at the end of the third quarter. Freshmen act as rodmen, chainmen, axemen, etc.

4b. Summer School in Railroad Surveying. 2 cr. Mr. Snow.

Required of all sophomore civil engineering students at the end of the third quarter. A camp is established and regular field work is carried on for two weeks.

5. Theoretical Mechanics. 1 Q. Spring. 6 cr. Prerequisite Mathematics 4. Mr. Snow.

Forces and force systems, center of gravity and centroids, stress, principles of equilibrium, rectilinear and curvilinear motion, work and energy, impulse, momentum and vectors. Lect. 6.

6. Mechanics of Materials. 1 Q. Autumn. 5 cr. Prerequisite Civil Engineering 5. Mr. Conkling.

Elasticity and strength of timber, brick, stone and metals. Theory of beams, columns and shafts. Lect. 5.

6a. Applied Mechanics. 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 5. Mr. Conkling.

A short course in the study of the elasticity and strength of the building materials, and the theory of simple beams and short columns. For students in trades and industry. Lect. 3.

7. Highway Engineering. 1 Q. Spring. 3 cr. Prerequisites Civil Engineering 2, 4. Mr. Conkling.

Preliminary investigations; surveying, mapping and design; grading, drainage, and foundations; natural and hard surfaced roads; pavements, etc. Lect. 2; lab. 1.

8. Strength of Materials. 1 Q. Autumn. 1 cr. Prerequisite Civil Engineering 6. Fee $2; Deposit $2. Mr. Conkling.

Experimental determinations of the strength and the several moduli of the more important of the materials of engineering. Lab. 1.

9. Railroad Economics. 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 4. Fee $1; Deposit $2. Mr. Snow.

Making of profiles, field maps, cross-sections, etc., from students' notes of field work. Economics of railroad location; arrangement of yards, terminals and stations. Making location map. Construction of the roadbed. Maintenance of way and the elements of railroad operation. Lect. 1; lab. 2.

12. Seminar. 1 Q. Spring. 1 cr. Mr. Conkling, Mr. Snow.

Members of the senior class meet to discuss the articles that appear in certain assigned engineering periodicals. Lect. 1.

14. Sanitary Engineering. 1 Q. Winter. 4 cr. Prerequisites Civil Engineering 1, 3, 15. Mr. Snow.

Methods of sewage treatment and disposal. The design of a sewage system and a disposal plant; house drainage; specifications and estimate of cost. Lect. 3; lab. 1.

15. Hydraulic Engineering. 2 Q. Winter and spring. 8 cr. Prerequisites, Civil Engineering 37, 38. Mr. Conkling.

Precipitation, drainage area, runoff, storage, public water supplies, reservoirs, pipe lines, pumping plants, purification plants, power development, etc. Lect. 3; lab. 1.

17. Geodesy. 1 Q. Autumn. 3 cr. Prerequisites Mathematics 6, Civil Engineering 1, 2, 4, Mr. Snow.

Base line measurements, triangulation balancing surveys and distributing errors, application of the method of least squares, principles of map projection. Determination of azimuth, latitude and longitude, the true north by sun and star observations. Lab. 3.

21. Foundations and Masonry. 1 Q. Spring. 4 cr. Prerequisites Civil Engineering 6, 28. Mr. Conkling.

Materials and methods employed in the construction of piers, abutments, masonry dams, retaining walls and foundations; economy of construction; specifications and costs. Lect. 3; lab. 1.

23. Contracts and Specifications. 1 Q. Spring. 2 cr. Mr. Conkling.

Correct form of specifications and judicial interpretation placed on technical terms commonly used in engineering specifications. Elective to all engineering students after the sophomore year. Lect. 2.

27. Thesis. 1 Q. Spring. 5 cr. Mr. Conkling.

The student will be required, before graduation, to present a suitable thesis upon some engineering subject in the line of his course. Subject must be chosen at the beginning of the senior year.

28. Graphic Statics. 1 Q. Autumn. 3 cr. Prerequisites Physics 1, 2, Civil Engineering 5. Fee $1; Deposit $2. Mr. Plew.

Stresses in roof trusses by the force polygon. Application of equilibrium polygon to beams and girders. Stresses in bridge trusses, retaining walls and masonry arches. Lab. 3.

29. Roofs and Bridges. 1 Q. Winter. 4 cr. Prerequisites Civil Engineering 6, 28. Mr. Plew.

Theory and computation of stress in roof and bridge trusses under dead, live, and wind loads. Locomotive wheel loads on plate girders and bridge trusses. Lect. 2; lab. 2.

30. Bridge Design. 1 Q. Autumn. 5 cr. Prerequisites Civil Engineering 6, 29. Fee $1; Deposit $2. Mr. Plew.

29. Fee $1; Deposit $2. Mr. Plew.

Designing of girders and trusses; computations and complete drawings for a through plate girder railroad bridge, and for a highway truss bridge. Specifications, bill of materials and estimate of cost. Lect. 1; drawing 4.

31. Bridges and Dams. 1 Q. Winter. 3 cr. Prerequisite Civil Engineering 30. Mr. Plew.

Higher structures, including continuous draw, cantilever, and suspension bridges; theory and design of masonry walls, and dams other than the gravity section. Lect. 3.

32. Concrete Design. 1 Q. Spring. 4 cr. Prerequisites Civil Engineering 6, 30. Fee $1; Deposit $2. Mr. Plew.

Design of reinforced concrete beams and slabs, reinforced concrete buildings and other structures. A complete design of a reinforced concrete arch by the Elastic Theory. Specifications and costs. Lect. 2; lab. 2.

34. Cement Laboratory. 1 Q. Winter. 1 cr. Prerequisite Civil Engineering 6. Fee $2; Deposit $2. Mr. Conkling.

Manufacture and properties of hydraulic cement, proportioning and mixing concrete. Standard tests of sand and cement. Test of concrete beams, etc. Lab. 1.

35. Highway Engineering. 1 Q. Winter. 3 cr. Prerequisite Civil Engineering 7. Mr. Conkling.

Roads and pavements, contracts and specifications; methods of financing; organization and administration; legislation and state laws. Lect. 2; lab. 1.

36. Irrigation Engineering. 1 Q. Autumn. 4 cr. Mr. Conkling.

History of irrigation; the principles of irrigation and location of irrigation system. Lect. 4.

37. Hydraulics. 1 Q. Winter. 4 cr. Prerequisites Mathematics 1, 2, 4, Physics 1, 2. Mr. Conkling.

Theoretical hydraulics, hydraulic measurements; flow of water through orifices, over weirs, through pipes, conduits and canals. Lect. 4.

38. Hydraulic Laboratory. 1 Q. Spring. 1 cr. Prerequisite Civil Engineering 37. Fee $2; Deposit $2. Mr. Conkling.

Flow of water over weirs, through nozzles and pipes, open channels and conduits, etc. Lab. 1.

39. Canal Surveying. 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 1. Fee $1; Deposit $2. Mr. Snow.

Theory and practice of canal surveying, computation of earth work, field location of canals and ditches for irrigation. Lect. 1; field work 2.

40. Irrigation Engineering. 1 Q. Spring. 5 cr. Prerequisites Civil Engineering 36, 37, 38. Mr. Conkling.

Manner of supplying, storing, conveying and distributing irrigation water; management of irrigation systems; irrigation laws. Lect. 5.

41. Canal Management. 1 Q. Spring. 5 cr. Prerequisite Civil Engineering 40. Mr. Snow.

Canal management, seepage and drainage. Lect. 5.

42. Pumping for Irrigation. 1 Q. Spring. 5 cr. Prerequisites Civil Engineering 37, 38, Mechanical Engineering 15a. Mr. Conkling.

Small rotary and reciprocating pumps. Steam, gas and oil engines used for pumping. Electric motor driven pumps. Lect. 5.

43. Elementary Hydraulics. 1 Q. Winter. 2 cr. Prerequisites Mathematics 1, 2, 4, Physics 1, 2. Mr. Conkling.

Elementary course in theoretical hydraulics for students in architectural engineering. Course given each alternate year beginning February 1918.

44. Concrete Construction. 2 Q. Winter and Spring. 6 cr. Prerequisite Civil Engineering 6a. Fee $2; Deposit $2. Mr. Conkling.

A study of cements and cement products; their manufacture, storage, etc. The effects of impurities, proportioning and mixing aggregates, upon the strength and life of concrete. The design and methods of construction of simple concrete structures, such as floors, walks, flumes, troughs, small culverts, small cisterns etc. Lect. 1; lab. 2.

45. Engineering Economics. 1 Q. Spring. 4 cr. Prerequisite Economics 3. Mr. Snow.

A study of economic questions of interest to engineers and others engaged in the industries, including methods of valuation of public utilities, commerce commission reports, determination of most economic machines, annuities, interest, perpetuities, present worth, etc.

ELECTRICAL ENGINEERING

Professor, J. A. Thaler. Instructor, R. D. Sloan.

The course in electrical engineering is designed to give a thorough technical training in which theoretical subjects and the application of theory to the solution of practical problems are emphasized.

The general training consists of courses in English, mathematics, physics, chemistry, drawing and shop work. The technical work covers the theory and application of electrical phenomena, and the designing and testing of electrical machines and apparatus.

The equipment of the electrical laboratory is very complete, with apparatus of modern type, as well as machines of historical value. The laboratories contain various types of direct and alternating current dynamos and motors, storage batteries, an oscillograph, a 150,000 volt transformer, a wireless station, and other equipment.

1. Electrical Machinery. 1 Q. Autumn. 3 cr. Mr. Thaler

Construction, care and operation of commercial electrical machines and apparatus, including batteries, electric lights, dynamos, motors, alternators, transformers, and electrical measuring instruments. Lect. 3.

3. Dynamos and Motors. 2 Q. Autumn and Winter. 6 cr. Prerequisites Physics 1, Mathematics 4. Mr. Sloan.

Principles of electro-magnetism, theory of dynamo electric machines, design, construction and regulation of direct current dynamos and motors. Lect. 3.

4. Electrical Laboratory. 2 Q. Winter and Spring. 5 cr. Prerequisite Physics 2. Fee $1; Deposit $5. Mr. Sloan.

Determination of armature and field resistance magnetic leakage coefficients, characteristic curves and the efficiency and regulation of various types of direct current machines. Lab. 3.

5. Applied Electricity. 1 Q. Spring. 4 cr. Mr. Sloan.

Storage batteries, electric lighting and lighting systems. Direct current distribution systems. Lect. 4.

7. Electrical Diagrams. 3 Q. Autumn, winter and spring. Continuous. 8 cr. Mr. Sloan.

Conventional methods of representing electrical wiring and appliances. National Electrical Code. Diagrams of D. C. Switchboards and electric light wiring. General and detail drawing of dynamos. Lect. 1; lab. 2.

8. Dynamo Design. 3 Q. Autumn, winter and spring. Continuous. 7 cr. Prerequisite Electrical Engineering 7. Mr. Sloan.

Designing electro-magnets, dynamos and motors. Complete working drawings and specifications to accompany each design. Lab. 2.

9. Alternating Currents. 3 Q. Autumn, winter and spring. Continuous. 12 cr. Prerequisite Physics 5. Mr. Thaler.

Theory of alternating currents, properties of alternating current circuits, principles of alternators, transformers, rotary converters and induction motors. Lect. 4.

10. Electrical Laboratory. 3 Q. Autumn, winter and spring. Continuous. 8 cr. Prerequisite Physics 5. Fee $1; Deposit $5. Mr. Thaler.

Tests of alternating current generators, motors and transformers, calibration of alternating current measuring instruments. Lab. 3.

13. Electrical Design. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Sloan.

Drawing and design of alternating current apparatus, circuits, and power plants. Open to students taking electrical engineering. Lect. 1; lab. 2.

14. Electrical Power. 1 Q. Winter. 4 cr. Mr. Sloan.

Theory and construction of direct and alternating current generators, motors, transformers, and storage batteries; principles of power transmission and distribution. Lect. 4.

14a. Electric Power. 1 Q. Spring. 4 cr. Prerequisite Electrical Engineering 14. Fee $1; Deposit $5. Mr. Sloan.

Industrial applications of electricity. Electrical equipment of power stations and substations. Efficiency and regulation tests of batteries, transformers, direct and alternating current generators and motors. Lect. 2; lab. 2.

15. Radio Telegraphy. 3 Q. Autumn, winter and spring. Continuous. cr. variable. Mr. Thaler.

Theory development and practice of radio telegraphy; commercial apparatus and instruments for sending and receiving station. Lect. 1; lab. 2.

17. Seminar. 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Thaler.

Weekly meeting for the purpose of discussing current electrical engineering literature. Lect. 1.

18. Special Design. Credits variable. Mr. Thaler.

Design and construction of some special electrical apparatus or machine. Elective for seniors.

19. Illumination. 1 Q. Spring. 3 cr. Mr. Thaler.

Sources of light, laws of photometry and measurement of light, calculation of illumination, electric light wiring, underwriters' rules and symbols of the National Contractors' Association. Lect. 1.

20. Thesis. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Thaler.

Before graduating each student must present a suitable thesis upon some engineering subject in line with his course. The subject for the thesis must be chosen at the beginning of the senior year.

MECHANICAL ENGINEERING

Professor, A. W. Richter (Dean). Assistant Professors, W. J. Wohlenberg, R. T. Challender. Instructors, F. C. Miller, F. C. Homann, F. Kately.

The course in mechanical engineering furnishes fundamental training in the science, the art and the business of engineering; the design, operation, superintendence and management of power plants, heating plants, refrigerating plants, lighting plants, pumping plants, and the mechanical equipment of mines and railroads; and for the design, manufacture, installation, testing and operation of shop and laboratory machinery, steam and gas engines and auxiliary equipment.

The course comprises four years' instruction and training by text book, lecture, laboratory and shop practice, based on mathematics, physics, chemistry, mechanics, machine design, structural design and thermodynamics. It is designed to give the student a thorough knowledge of the basic principles of his profession and such technical

skill as the application of theoretical principles in every day practice in shop and laboratory will insure. The work of each department, class room, laboratory, shop and designing room is made to supplement the work of each of the others, so that the graduate beginning his profession has a valuable fund of practical and scientific knowledge.

1. Mechanical Drawing. 1 Q. Autumn. 2 or 4 cr. Mr. Miller.

Use of drawing instruments and plain lettering; problems in geometric construction to teach accuracy in the use of instruments; orthographic projections, dimensions, arrangement, titles. Lab. 2 or 4.

1b. Mechanical Drawing. 1 Q. Spring. 3 cr. Mr. Miller.

Lettering; titles; exercises in arranging printed material. Use of instruments; diagrams; simple working drawings. Lab. 3.

2. Shop Work. 1 Q. Autumn. 2 cr. Fee $2; Deposit $2. Mr. Challender, Mr. Homann, Mr. Kately.

Use and care of carpenters' tools. Wood work. Elementary pattern work. Iron forging, upsetting and welding. Lab. 2.

2a. Pattern Work. 1 Q. Spring. 2 cr. Prerequisite Mechanical Engineering 2. Fee $1. Mr. Challender.

Construction of wood patterns for use in the foundry. Advanced pattern work. Lab. 1.

2b. Wood Work. 1 Q. Autumn. 2 cr. Fee $3; Deposit $2. Mr. Challender.

Use and care of carpenters' tools and practice in working to dimensions from blue-prints, building construction, roof framing and mill work. Lab. 2.

3. Descriptive Geometry. 2 Q. Winter and spring. 7 cr. Mr. Miller.

Projection of lines, plane surfaces and solids; intersections, tangents, to curves and surfaces; problems in warped surfaces, practical applications. Lect. 1; lab. 2. Lect. 1; lab. 3.

4. Foundry. 1 Q. Winter. 2 cr. Fee $1. Mr. Kately.

Floor and bench molding, core making, pouring castings of iron, brass and other alloys. Lab. 2.

5. Mechanism. 1 Q. Autumn. 3 cr. Prerequisite Mechanical Engineering 1. Mr. Challender.

Relative motions of machine parts, including rolling cylinders and cones, lobed wheels, belts, levers, cams, linkwork, parallel and car steering mechanisms. Lect. 2; lab. 1.

7. Steam and Gas. 2 Q. Autumn and winter. 5 cr. Prerequisites Chemistry 1, Physics 1, 2. Mr. Richter.

Steam boilers, their classification and construction, combustion and furnace efficiency, the principles underlying the economical transfer of heat from the furnace to the water. Steam and gas engines, scale corrosion and feed water treatment. Lect. 2.

8. Mechanism. 2 Q. Winter and spring. 6 cr. Prerequisites Mechanical Engineering 1, 5. Mr. Challender.

Gearing, cycloidal and involute systems, spur, bevel, helical and worm gears. Change gears, gearing in train, epicyclic trains with special application to automatic feeds and differential transmission. Valve gears. Plain and riding cut-off. Corliss and poppet valves. Lect. 1; lab. 2.

9. Machine Work. 1 Q. Spring. 4 cr. Fee $1; Deposit $1. Mr. Homann.

Bench work in iron, chipping and filing. Lathe work in metals. Boring, planning and milling of metals. Lab. 4.

11. Seminar. 2 Q. Winter and spring. 2 cr. Mr. Richter.

Weekly meetings for the presentation and discussion of papers upon assigned topics pertaining to mechanical engineering. Lect. 1.

13. Machine Design. 2 Q. Winter and spring. 6 cr. Prerequisite Mechanical Engineering 8. Mr. Wohlenberg.

Elementary theory of machine design supplemented by applications in the drafting room. Straining actions in stressed machine members and frames, materials used and forms for strength, fastenings, friction. Journals and design elements of mechanical transmitters of power. Lect. 2; lab. 1.

15. Mechanical Laboratory. 1 Q. Autumn. 3 cr. Prerequisite Physics 1. Mr. Wohlenberg.

Calibration of instruments, calorimetry, indicator practice, steam, fuel and lubricating oils. Determination of power input, output and mechanical efficiency. Lect. 1; lab. 2.

15a. Mechanical Laboratory. 1 Q. Winter. 1, 2 or 3 cr. Prerequisite Mechanical Engineering 7. Fee $1. Mr. Wohlenberg.

Short Course. Indicator practice; efficiency tests of boilers, pumps and electric power units.

18. Thermodynamics. 3 Q. Autumn, winter and spring. Continuous. 12 cr. Prerequisites Mathematics 4, Chemistry 1, Physics 1, 2. Mr. Richter.

Gases, saturated and superheated vapors and mixtures, cycle processes, flow of fluids through nozzles, and throttling processes. Heat engines and boilers. Lect. 5 and 2.

18a. Heat Power. 1 Q. Spring. 3 cr. Prerequisite Mechanical Engineering 7. Mr. Richter.

Prime movers for central stations. Lect. 3.

20. Mechanical Laboratory. 1 Q. Winter. 2 cr. Prerequisites Mechanical Engineering 15, 18. Fee $2. Mr. Wohlenberg.

Exercises in valve setting. Fuel consumption tests of gasoline and oil engines. Tests of injectors, pumps and engines, etc. Lab. 2.

21. Machine Work. 1 Q. Autumn. 4 cr. Prerequisite Mechanical Engineering 2. Fee $1; Deposit $2. Mr. Homann.

General shop work, building complete machines. Lab. 3.

22. Gas Power Engineering. 1 Q. Autumn. 4 cr. Prerequisites Mechanical Engineering 13, 18. Mr. Wohlenberg.

Performance and design of gas motors, gas producers and other gas machinery. Gas mixtures and their behavior within the engine cylinder. Method of governing. Types of engines. Lect. 4.

22a. Gas Power. 2 Q. Autumn and spring. 5 cr. Prerequisites Mechanical Engineering 15a, 18a. Mr. Wohlenberg.

A brief discussion of the internal combustion engine cycles followed by study of commercial types of engines and auxiliaries. Methods of testing and American practice in rating internal combustion engines. Lect. 3; lab. 2.

23. Engine and Turbine Design. 2 Q. Autumn and winter. 8 cr. Prerequisites Mechanical Engineering 13, 18. Mr. Wohlenberg.

Cylinder valve and port design. Engine frame. Energy cycle of reciprocating parts. Crank shaft and fly wheel design. Governor energy cycle and design to accomplish given speed regulations. Nozzle and blade design. Stresses and strains in rotating discs and drums. Forms for strength. Lect. 2; lab. 2.

24. Heating and Ventilation. 1 Q. Spring. 2 cr. Prerequisite Mechanical Engineering 7. Mr. Richter.

Heating buildings by the various systems; ventilation with calculations for specific installations, specifications and estimate of costs. Lect. 2.

25. Commercial Engineering. 1 Q. Spring. 4 cr. Mr. Wohlenberg.

General principles underlying the organization, management and operation of industrial establishments. Valuation of the physical properties of a plant. The public utility commission and public service corporations. The United States patent office. Inventions and their protection. Application for patents. Lect. 4.

26. Mechanical Engineering of Steam Power Plants. 1 Q. Winter. 4 cr. Prerequisites Mechanical Engineering 13, 18. Mr. Wohlenberg.

A study of modern mechanical equipment of steam power plants with reference to design factor magnitudes determining its selection. Principles underlying design of complete plant. Specifications as submitted to builders of equipment and to erectors of plant. Lect. 4.

27. Machine Tool Work. 2 Q. Winter and Spring. 4 cr. Fee $1; Deposit $2. Mr. Homann.

Work on lathe, milling machine and grinder; manufacture of reamers, drills, taps, mills and dies. Lab. 2.

28. Mechanical Laboratory. 1 Q. Autumn. 2 cr. Prerequisite Mechanical Engineering 15. Fee $1; Deposit 2. Mr. Wohlenberg.

Efficiency tests of heating, ventilating, compressed air, refrigerating and power plant equipment, steam and gas power plants and machinery. Lab. 2.

29. Plant Design. 1 Q. Spring. 3 cr. Prerequisite Mechanical Engineering 26. Mr. Wohlenberg.

An application of the principles taught in mechanical engineering 26 in the design of a power plant for a specific purpose. Lect. 1; lab. 2.

30. Thesis. 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Before graduating the student is required to present an accepted thesis involving an investigation of some problem related to mechanical engineering. Work will be done under the supervision of the head of the department, but the student will devise his own methods.

32. Automobile Practice. 1 Q. Autumn or winter or spring. 2 cr. Fee $2. Mr. Homann.

Engines, carburetors, ignition and lighting systems, oiling and tires. Number in class will be limited. Lab. 2.

33. Tractor Power. 1 Q. Winter. 3 cr. Mr. Homann.

Steam, gasoline and oil tractors. Lab. 2.

34. Machine Work. 1 Q. Autumn. 2 cr. Fee $1; Deposit $2. Mr. Homann.

General machine work, continuation of course Mechanical Engineering 9. For electrical engineers. Lab. 2.

35. Advanced Mechanical Engineering. Elective 2 to 5 cr. Prerequisites Mechanical Engineering 13, 18.

An investigation and study of the application of the principles of thermodynamics and machine design in the solution of such energy transformer systems as are used in modern mechanical engineering practice.

36. Plumbing and Steam Fitting. 2 Q. Autumn and winter. 4 cr.

A study of modern plumbing equipment, valves, piping, conduits, connections, packing etc., calculations to determine transmission losses in pipes, bends and valves for the purpose of determining pipe or conduit sizes. Lect. 2; lab. 2.

College of Applied Science

The departments comprised in the College of Applied Science have a two-fold duty to perform.

(1) They give instruction and training in the fundamental sciences as applied in agriculture, engineering and home economics. A large and important part of the student's work in these major divisions, of the institution is given in the science departments.

(2) They also offer several courses of instruction in which the main object is to prepare specialists in the various branches of the basic sciences. These courses also give an excellent general training and may be taken by those students of agriculture, engineering and home economics, who desire to give more attention to the fundamental and less to the more specialized branches of agriculture, engineering and home economics.

The courses of instruction in the College of Applied Science, each leading to the degree of Bachelor of Science, are as follows: 1, Botany and Bacteriology; 2. Chemistry; 3. Entomology and Zoology; 4. Industrial Chemistry.

Recognizing that beginning students will be benefited by an opportunity to spend at least one year in the institution before committing themselves to a line of study to be followed, the work in the freshman year has been made much alike in courses 1, 2, and 3, while in course 4 the freshman year is like that of the engineering course. During his first year the student takes up a considerable variety of studies and often learns what line of work he is best adapted for. At the opening of the sophomore year he can change courses within the same group without loss of time. Again, the freshman year in the agricultural courses, listed elsewhere in the catalogue, is so much like the freshman year in the first three courses that usually a change in either direction can be made without inconvenience. In the same way changes can be made between the industrial chemistry course and those in engineering.

COURSE IN BOTANY AND BACTERIOLOGY.

FRESHMAN YEAR.

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Trigonometry and Logarithms (Math. 8) or			
Elementary Analysis (Math. 7)	4		
General Botany (Bot. 1)		6	
Agricultural Physics (Phys. 1a)			6
Systematic Botany (Bot. 2)			5
Elective	5	3	4
Physical Education (Phys. Ed. 1) or			
Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Invertebrate Zoology (Zool. 1)	6		
Human Physiology (Zool. 3)		6	
Economic Entomology (Ento. 4)			4
Organic Chemistry (Chem. 5)	6		
Agricultural Chemistry (Chem. 7)		6	
Plant Physiology (Bot. 3)			6
Elective	4	4	6
Physical Education (Phys. Ed. 2) or			
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR.

Advanced Composition (Eng. 3) or			
English Literature (Eng. 10)	2	2	2
General Bacteriology (Bact. 12)	6		
Sanitary Bacteriology (Bact. 13)		3	
Mycology (Bot. 5)			5
Embryology (Zool. 8)	3	3	
Geology (Geol. 1)		4	
Organic Evolution (Zool. 9)			4
Elective	8	7	8

SENIOR YEAR.

Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			3
Plant Pathology (Bot. 4)	6		
Microbiology (Bact. 14)			5
Thesis (Bot. 11)	5	5	5
Elective	5	11	6

COURSE IN CHEMISTRY.

Options: (a) Agricultural Chemistry; (b) Food Chemistry; (c) Bio-chemistry.

FRESHMAN YEAR.	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Trigonometry and Logarithms (Math. 8) or			
Elementary Analysis (Math. 7)	4		
General Botany (Bot. 1)		6	
Qualitative Analysis (Chem. 2)			4
Agricultural Physics (Phys. 1a)			6
Elective	5	3	5
Physical Education (Phys. Ed. 1) or			
Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR.			
Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Quantitative Analysis (Chem. 3)	5	5	5
Invertebrate Zoology (Zool. 1)	6		
Human Physiology (Zool. 3)		6	
Elective	5	5	11
Physical Education (Phys. Ed. 2) or			
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR.			
Organic Chemistry (Chem. 9)	5	5	5
Quantitative Analysis (Chem. 4)	5		
General Bacteriology (Bact. 12)	6		
Physical Chemistry (Chem. 19)		5	5
Sanitary Bacteriology (Bact. 13)		3	
Microbiology (Bact. 14)			5
Elective	3	6	4

SENIOR YEAR.			
Economics (Econ. 3)	3	3	
Industrial Chemistry (Chem. 14)	5		
Water Analysis (Chem. 18)		3	
Physiological Chemistry (Chem. 11)			5
Seminar (Chem. 20)	1	1	1
Elective	10	12	13

COURSE IN ENTOMOLOGY AND ZOOLOGY.

FRESHMAN YEAR.

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Trigonometry and Logarithms (Math. 8) or			
Elementary Analysis (Math. 7)	4		
General Botany (Bot. 1)		6	
Agricultural Physics (Phys. 1a)			6
Systematic Botany (Bot. 2)			5
Elective	5	3	4
Physical Education (Phys. Ed. 1) or			
Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Invertebrate Zoology (Zool. 1)	6		
Human Physiology (Zool. 3)		6	
Economic Entomology (Ento. 4)			5
Organic Chemistry (Chem. 5)	6		
Agricultural Chemistry (Chem. 7)		6	
Plant Physiology (Bot. 3)			6
Elective	4	4	5
Physical Education (Phys. Ed. 2) or			
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR.

Advanced Composition (Eng. 3) or			
English Literature (Eng. 10)	2	2	2
General and Systematic Entomology (Ento. 5)	3	3	
Vertebrate Zoology (Zool. 2)			6
General Bacteriology (Bact. 12)	6		
Advanced Economic Entomology (Ento. 6)		3	3
Geology (Geol. 1)		4	
Elective	8	7	8

SENIOR YEAR.

Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			3
Embryology (Zool. 8)	3	3	
Organic Evolution (Zool. 9)			4
Thesis (Ento. 10)	3-5	3-5	3-5
Elective	8	8	7

Note—Students who intend to make professional use of Entomology or Zoology will be required before graduation to have a reading knowledge of French or German.

COURSE IN INDUSTRIAL CHEMISTRY.

FRESHMAN YEAR.

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Qualitative Analysis (Chem. 2)			4
Engineering Mathematics (Math. 1)	5		
Engineering Mathematics (Math. 2)		6	
Engineering Mathematics (Math. 3)			6
Elective	4	3	5
Physical Education (Phys. Ed. 1) or Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Quantitative Analysis (Chem. 3)	5	5	5
Engineering Mathematics (Math. 4)	6		
Engineering Mathematics (Math. 5)		6	
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Theory of Mechanics (C. E. 5)			6
Physical Education (Phys. Ed. 2) or Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR.

Quantitative Analysis (Chem. 4)	5		
Organic Chemistry (Chem. 9)	5	5	5
Physical Chemistry (Chem. 19)		5	5
Elective	9	9	9

SENIOR YEAR.

Economics (Econ. 3)	3	3	
Industrial Chemistry (Chem. 14)	5	5	5
Fuel Analysis (Chem. 17)			3
Seminar (Chem. 20)	1	1	1
Elective	10	10	10

BOTANY AND BACTERIOLOGY.

PROFESSOR, D. B. SWINGLE. ASSISTANT PROFESSOR, H. M. JENNISON.

Botany and bacteriology are among the sciences most fundamental to agriculture. Through botany we learn of the different kinds of plants, their relationship, structure, nutrition, growth and reproduction, and the fungus parasites responsible for many plant diseases. Through bacteriology, we learn of plant and animal diseases and of important chemical changes brought about by micro-organisms in soil, dairy products, silage, and other kinds of organic matter. While botany and bacteriology have other aspects besides those relative to agriculture the latter are especially emphasized here.

The four-years course leading to a degree in botany and bacteriology has two major purposes aside from its disciplinary value. First, to train men for professional career in botany, plant pathology, agricultural bacteriology and related subjects; second, to prepare students for the study of medicine in other institutions. With a judicious selection of electives this is a very good premedical course.

Every effort is made to maintain in this course the high standard found in similar courses of undergraduate work in the larger universities. A number of the best students get the additional opportunity of working in the laboratories of the experiment station, where, in addition to making part of their expenses, they can become familiar with the methods used in research work in this department.

This course is characterized by a liberal amount of work in the other sciences, especially chemistry, and enough elective space for courses in applied agriculture, language, etc.

1. General Botany. 1 Q. Winter. 6 cr. Prerequisite to other botany courses. Fee $2; Deposit $2. Mr. Swingle, Mr. Jennison.

Survey of the entire plant kingdom, and under each group of plants is discussed the structure, physiology, evolution, life history and economic significance of representative examples. Lect. 3; lab. 3.

2. Systematic Botany. 1 Q. Spring. 5 cr. Prerequisite Botany 1. Fee $3. Mr. Swingle, Mr. Jennison.

Principles underlying classification and application of principles in laboratory and field; especially Montana plants. Lect. 2; lab. 3.

3. Plant Physiology. 1 Q. Spring. 6 cr. Prerequisites Botany 1, Physics 1a, Chemistry 5. Fee $3; Deposit $3. Mr. Jennison.

Nutrition, growth, reproduction, and movement in plants, especially the higher forms. Lect. 3; lab. 3.

4. Plant Pathology. 1 Q. Autumn. 6 cr. Prerequisites Botany 1, Bacteriology 12. Fee $3. Mr. Jennison.

Plant diseases, including the relations of host and parasites, immunity and susceptibility of host and nature of diseases not caused by parasites. Lect. 3; lab. 3.

5. Mycology. 1 Q. Spring. 5 cr. Prerequisite Botany 1. Fee $3. Mr. Jennison.

A comparative study of the structure, physiology and classification of fungi. Lect. 2; lab. 3.

11. Thesis. Credits variable. Fee $1; Deposit $4. Mr. Swingle, Mr. Jennison.

Open to seniors in the botany and bacteriology course, and to others who have had sufficient preparation.

12. General Bacteriology. 1 Q. Autumn. 6 cr. Prerequisites Chemistry 1, one course in botany or zoology. Fee $4; Deposit $3. Mr. Swingle, Mr. Jennison.

Structure, physiology and classification of bacteria, their growth in nutrient media and methods of bacteriology technique. Relation of bacteria to agriculture, to human and animal pathology to the arts and industries. Lect. 3; lab. 3.

13. Sanitary Bacteriology. 1 Q. Winter. 3 cr. Prerequisite Bacteriology 12. Mr. Swingle.

Treating of infectious diseases. Sources and modes of infection for self protection and the protection of others. Lect. 3.

14. Microbiology of Waters and Foods. 1 Q. Spring. 5 cr. Prerequisite Bacteriology 12. Fee $4; Deposit $3. Mr. Swingle, Mr. Jennison.

A study of micro-organisms in relation to the sanitary qualities of waters and foods. Foods will be studied on even years and waters on odd years. Lect. 2; lab. 3.

15. Elementary Bacteriology. 1 Q. Spring. 5 cr. Fee $3; Deposit $2. Mr. Swingle, Mr. Jennison.

Beginning nurses course. Microscopical and cultural studies of organisms; laboratory tests for diagnosis; bacteria in relation to infectious diseases. Lect. 2; lab. 3.

CHEMISTRY.

Professor, W. M. Cobleigh. Assistant Professor, E. J. Quinn. Instructor, E. C. Hytree. Assistant, Janelle Lund.

The applications of chemistry to the various phases of agriculture to home economics, to engineering and to many modern industries make this science an important one in a technical school.

Two college courses in chemistry are offered by the science division:

I. Chemistry. Electives are offered in each year of the course in order that the student may adapt his training to one of the following special fields. The student must elect one of following options:

a. **Agricultural Chemistry.** Electives should be chosen from the various sub-courses in agriculture, biology, chemistry, and language. This will give the student an excellent training in scientific agriculture and prepares for positions in agricultural colleges and experiment stations, and the government service.

b. **Food Chemistry.** Electives should be chosen from home economics courses, biology, chemistry, and language.

c. **Bio-chemistry.** Electives should be taken mainly from biology, chemistry, and language. This course prepares students for positions in state and municipal food laboratories, in water purification works and in sewage disposal plants.

II. **Industrial Chemistry.** In this course engineering, mathematics, physics, and language may be elected as minor subjects. This course prepares students for positions in the manufacturing industries. In the senior year attention will be directed to the importance of industrial chemical research and each student will work on a definite problem of importance in some industry.

1. **General Chemistry.** 2 Q. Autumn and winter. 12 cr. Fee $5; Deposit $3. Mr. Cobleigh, Mr. Hytree, Miss Lund and assistants.

Fundamental laws of chemistry, the descriptive chemistry of the elements and their compounds, and elementary qualitative analysis. Lect. 4; lab. 2.

2. **Qualitative Analysis.** 1 Q. Spring. 4 cr. Prerequisite Chemistry 1. Fee $4; Deposit $4. Mr. Cobleigh.

The course is presented from the standpoint of modern theories of chemistry. Lect. 2; lab. 2.

3. **Quantitative Analysis.** 3 Q. Autumn, winter and spring. Continuous. 9 or 15 cr. Prerequisite Chemistry 1 or 2. Fee; Deposit 4. Mr.

Theory and technique of the methods of analytical chemistry and chemical calculations. Lect. 2; lab. 3.

4. **Quantitative Analysis.** 3 Q. Autumn, winter and spring. Continuous. 15 cr. Prerequisites Chemistry 3, 5. Fee $4; Deposit $4. Mr.

A continuation of Chemistry 3. Analysis of organic substances and agricultural products. Elective for students in agriculture and home economics. Lect. 2; lab. 3.

5. **Agricultural Organic Chemistry.** 1 Q. Autumn or spring. 6 cr. Prerequisite Chemistry 1. Fee $4.; Deposit $4. Mr. Hytree.

Compounds of the aliphatic and aromatic series and organic materials of interest to students of agriculture and home economics. Lect. 4; lab. 2.

6. **Advanced Inorganic Chemistry.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Prerequisites Chemistry 3, 9. Mr.....

Study of the elements according to the periodic classification of Mendeleef. Lect. 3.

7. Agricultural Chemistry. 1 Q. Winter. 6 cr. Prerequisite Chemistry 5. Fee $6; Deposit $4. Mr.

Composition and reaction of soils, preparation and valuation of fertilizers, insecticides, and fungicides, examination of feeding stuffs and of dairy products, and problems of farm sanitation. Lect. 4; lab. 2.

8. Food Chemistry. 1 Q. Spring. 6 cr. Prerequisite Chemistry 5. Fee $4; Deposit $4. Mr. Cobleigh.

Composition of foods, food production and preservation, food legislation and inspection. Lect. 4; lab. 2.

9. Organic Chemistry. 3 Q. Autumn, winter, and spring. Continuous. 15 cr. Prerequisite Chemistry 1. Fee $4; Deposit $4. Mr. Hytree.

Compounds of the aliphatic and aromatic series and organic preparations. Lect. 3; lab. 2.

11. Physiological Chemistry. 1 Q. Spring. 5 cr. Prerequisite Chemistry 5. Fee $4; Deposit $3. Mr. Hytree.

Functions of fats, carbohydrates, protein and salts in nutrition together with a study of the chemistry of digestion and metabolism. Lect. 3; lab. 2.

12. Engineering Chemistry. 1 Q. Autumn. 4 cr. Prerequisite Chemistry 1. Fee $4; Deposit $4. Mr. Cobleigh.

Chemistry and production of lime, mortar, cement, refractory materials, iron, steel, and copper. Qualitative and approximate quantitative examinations of the materials listed above as an aid in studying their chemical properties. Lect. 2; lab. 2.

14. Industrial Chemistry. 3 Q. Autumn, winter and spring. Continuous. 15 cr. Prerequisites Chemistry 2, 3, 9. Fee $4; Deposit $4. Mr. Cobleigh.

The application of chemistry to the industries, including the operations common to many chemical industries such as crushing, grinding, calcination, fusion, distillation, crystallization, etc., and types of machinery used in these operations. Inspections and reports on various industrial plants in the state. Lect. 3; lab. 2.

17. Fuel Analysis. 1 Q. Spring. 3 cr. Prerequisite Chemistry 3. Fee $4; Deposit $4. Mr. Cobleigh.

Production and analysis of solid, liquid and gaseous fuels, illuminating gas, and lubricating oils. Lect. 1; lab. 2.

18. Water Analysis. 1 Q. Winter or spring. 4 cr. Prerequisites Chemistry 1, 3. Fee $4; Deposit $4. Mr. Cobleigh.

Chemical examination of potable waters, of water for industrial purposes and steam raising, of sewages, and of air. Water purification and softening, and sewage treatment. Lect. 2; lab. 2.

19. Physical Chemistry. 2 Q. Winter and Spring. 10 cr. Prerequisite Chemistry 3. Fee $2; Deposit $2. Mr. Hytree.

Theoretical chemistry, including the following topics. Stoichometry, the gas laws; kinetic theory of gases, radioactivity, the electron theory, colloids, osmotic pressure, the theory of solution, phase rule, equilibrium in electrolytes and electro chemistry. Lect. 3; lab. 2.

20. Seminar. 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Cobleigh, Mr., Mr. Hytree.

Each student will be required to make abstracts of articles on assigned subjects from the leading journals, and present them at weekly meetings of the students and department instructors where the topics are discussed. Lect. 1.

21. Thesis. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Cobleigh, Mr., Mr. Hytree.

Students in the chemistry course may in the senior year prepare a thesis on some subject which will involve considerable laboratory work and originality. Lab. 2.

ENTOMOLOGY AND ZOOLOGY.

Professor, R. A. Cooley. Assistant Professor, M. H. Spaulding. Mr. A. L. Strand.

Taken as a whole the courses in this department are primarily designed to give training in the zoological branches as they are applied in horticulture, agronomy, animal husbandry, general agriculture, and home economics. They form a basis for an understanding of the various phases of the development of life and the problems of evolution. They throw light on the problems of social science, and are well designed for purposes of general education.

The department is well equipped with the necessary microscopes, microtomes, photographic apparatus and dark rooms and miscellaneous equipment which permit all courses listed to be given in a thorough manner.

The various animal groups are well represented in the collections. In the museum room are about five hundred skins of mammals and birds, while among the study materials is an unusually full series of marine and fresh water invertebrates.

The insect collections are especially large and useful. Many thousands of pinned speciments are arranged in the cabinets and these together with microscopical slides and alcoholic materials constitute one of the best insect collections in the West.

The library contains a very valuable accumulation of books and pamphlets dealing with zoological subjects. It is especially strong in entomological literature. The more important scientific journals of this country and others are regularly received and the library has more or less complete sets of back numbers bound and placed on the shelves.

1. Invertebrate Zoology. 1 Q. Autumn. 6 cr. Fee $3. Mr. Spaulding.

Invertebrate animals, including their morphology, development habits, economic or popular interest and classification. Lect. 3; lab. 3.

2. Vertebrate Zoology. 1 Q. Spring. 6 cr. Prerequisite Zoology 1. Fee $3. Mr. Spaulding.

Vertebrate (chordate) animals, treating in detail the structure and relationships of the different groups; their classification and economic importance. Elective to all students. Lect. 3; lab. 3.

3. Human Physiology and Anatomy. 1 Q. Winter. 6 cr. Prerequisite Zoology 1. Fee $3. Mr. Spaulding.

Lect. 3; lab. 3.

4. Economic Entomology. 1 Q. Spring. 5 cr. Prerequisite Zoology 1. Fee $2. Mr. Cooley.

Anatomy, metamorphosis and classification of insects; study of the various orders and of the principle families with particular reference to the species of economic importance. Lect. 3; lab. 2.

5. General and Systematic Entomology. 2 Q. Autumn and winter. 3 cr. Prerequisite Entomology 4. Fee $2. Mr. Cooley.

Morphology and classification of insects with some consideration of physiology, development, and adaptations. Lect. 1; lab. 2. Lect. 2; lab. 1

6. Advanced Economic Entomology. 2 Q. Winter and spring. 3 cr. Prerequisite Entomology 4. Fee $2. Mr. Cooley.

Insect pests and insect control. Lect. 1; lab. 2.

7. Advanced Entomology. 3 Q. Autumn, winter and spring. Continuous. 6 to 10 cr. Prerequisites Entomology 4, 5, 6. Fee $2. Mr. Cooley.

Individual instruction to fit the students' needs, including systematic, economic, biological, and library work.

8. Embryology. 2 Q. Autumn and winter. 6 cr. Prerequisite Zoology 2 or 3. Fee $3. Mr. Spaulding.

Foundation and growth of tissues in the vertebrate body, based chiefly on a study of the chick, but including consideration of the development in the mammalia. Lect. 1; lab. 2.

9. Organic Evolution. 1 Q. Spring. 4 cr. Mr. Spaulding.

Evolution theories and their present status; also heredity, variation, natural and artificial selection, adaptations, etc. Lect. 4.

10. Thesis. Credits variable, not to exceed 5. Fee $2 to $10. Mr. Cooley or Mr. Spaulding.

Seniors in this department and seniors from other courses, who have had sufficient previous training, may elect this course.

11. Economic Zoology. 1 Q. Autumn. 3 cr. Prerequisite Zoology 1 or 2. Mr. Spaulding.

Discussion of vertebrates of economic importance and devoted chiefly to mammals and birds. Lect. 3.

12. Physiology and Hygiene. 1 Q. Winter. 6 cr. Fee $3. Mr. Spaulding.

Graduate nurses course. Dealing with the more important phases of physiology and hygiene supplementing the work already taken, with laboratory work with living tissues. Lect, 3; Lab. 3.

13. Parasitology. 1 Q. Spring. 4 cr. Prerequisite Zoology 1. Fee $3. Mr. Spaulding.

The structure, life history and habits of the parasitic groups of animals. Lect. 2; lab. 2.

College of Household and Industrial Arts.

The courses offered in the College of Household and Industrial Arts are: Applied Art, Home Economics, and Secretarial Work.

The purpose of each of the courses is indicated by its title. The industrial application of the work is emphasized in each course. The applied art course and secretarial work are open equally for men and women. Several subjects taught in departments not represented in the College of Household and Industrial Arts are open to election by students on consent of their adviser.

COURSE IN APPLIED ART.

FRESHMAN YEAR.	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
German (German 1 or 3) or			
French (French 1)	4	4	4
Freehand Drawing (Art. 1)	2		2
Clothing (H. E. 11)	3	3	
Design (Art 7)	2		3
Perspective (Art 15)	2		
Painting (Art 2)	2	2	3
General Botany (Bot. 1)		6	
Foods (H. E. 1a)			3
Physical Education (Phys. Ed. 1)	1	1	1
SOPHOMORE YEAR.			
Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
German (German 2) or			
German (German 5 and 6) or			
French (French 2)	4	4	4
History of Art (Art 6)	3	3	3
Foods (H. E. 1b)	3		
Human Physiology and Anatomy (Zool. 3)		6	
Freehand Drawing (Art 1a)	2		3
Painting (Art 2a)	2		
Handicraft (Art 10-11 12-13)			4
Historic Ornament (Art 7a)	2	2	2
Physical Education (Phys. Ed. 2)	1	1	1
JUNIOR YEAR.			
English Literature (Eng. 10)	2	2	2
Painting (Art 2b)	4		4
Modern Drama (Eng. 6)	2	2	2
Household Physics (Phys. 9)		4	
Advanced Design (Art 7b)	2	2	2
Freehand Drawing (Art 1b)	3		3
Composition (Art 16)		3	
Handicraft (Art 10-11-12-13)	2	2	2
Medieval History (Hist. 2)	3	3	3
SENIOR YEAR.			
Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			4
Psychology (Ed. 1)	3		
Handicraft (Art 10-11-12-13)	2	2	2
Advanced Design (Art 7c)	3	3	3
Thesis (Art 19)	4	4	4
Elective	4	7	6

COURSE IN HOME ECONOMICS.

	Autumn	Winter	Spring
FRESHMAN YEAR.			
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Foods (H. E. 1a)			3
Design (Art 7)	2		3
Textiles (H. E. 13)		2	2
Clothing (H. E. 11)	3	3	
Dressmaking (H. E. 12)			3
European History (Hist. 1) or			
Modern Language	3-4	3-4	3-4
Physical Education (Phys. Ed. 1)	1	1	1
SOPHOMORE YEAR.			
Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Invertebrate Zoology (Zool. 1)	6		
Human Physiology and Anatomy (Zool. 3)		6	
Food Chemistry (Chem. 8)			6
Organic Chemistry (Chem. 5)	6		
The House (H. E. 3)		3	
House Planning (A. E. 13)		1	
Food (H. E. 1b)	3		
Household Physics (Phys. 9)		4	
Food Study (H. E. 2)			7
Elective		2	3
Physical Education (Phys. Ed. 2)	1	1	1
JUNIOR YEAR.			
Bacteriology (Bact. 12)	6		
Sanitary Bacteriology (Bact. 13)		3	
House Management (H. E. 7)		2	
House Furnishing (Art 8b)	3		
Costume and Design (H. E. 15)			5
Advanced Dressmaking (H. E. 14)		2	
Physiological Chemistry (Chem. 11)			5
Economic Problems in Foods (H. E. 4)		2	
Quantitative Analysis (Chem. 3)	3	3	3
Home Nursing (H. E. 9)		2	
Elective	7	5	6
SENIOR YEAR.			
Education of Women (Ed. 10)	3		
Home Problems (H. E. 10)		4-6	
Advanced Food Studies (H. E. 5)			3
Dietetics (H. E. 6)	6		
Extension Course (H. E. 8)		4	
Advanced Textiles (H. E. 18)			3
Psychology (Ed. 1)	3		
Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			3
Elective	4	8-6	10

Note—If modern language has been taken in the high school, students may continue during the freshman year.

Elective for juniors and seniors: Home Economics (5), (16), (17), (19); Chemistry (4); English (6), (10); History (1), (2), (5); Poultry (7); Art (6), (7b), (7c), (14), (15), (16); Modern Language and Music.

COURSE IN SECRETARIAL WORK.

FRESHMAN YEAR.

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
Modern Language	4	4	4
Modern History (Hist. 7)	2	2	2
European History (Hist. 1)	3	3	3
General Chemistry (Chem. 1)	6	6	
Business Correspondence (Sec. 5)			2
Clothing (H. E. 11a) or			
Mechanical Drawing (M. E. 1b)			3
Physical Education (Phys. Ed. 1) or			
Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Modern Language	4	4	4
College Algebra (Math. 14)	3	3	
Theory of Investments (Math. 15)			3
Shorthand (Sec. 1)	4	4	4
Typewriting (Sec. 3)	4	4	4
Physical Education (Phys. Ed. 2) or			
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR.

English Literature (Eng. 10)	2	2	2
Office Practice (Sec. 6)	2	2	2
Economics (Econ 3)	3	3	
Shorthand (Sec. 2)	3	3	3
Industrial History (Hist. 10)	3	3	3
Typewriting (Sec. 4)	3	3	3
Psychology (Ed. 1)	3		
Commercial Law (Sec. 8)		3	3
Elective			3

SENIOR YEAR.

Economics of Business (Sec. 7)	2	2	
Sociology (Soc. 4)			4
Business Statistics (Sec. 20)	2	2	2
Accounting (Sec. 9)	3	3	3
Shorthand (Sec. 11)	2	2	2
American History (Hist. 5)	3	3	3
Typewriting (Sec. 12)	3	3	3
Elective	4	4	2

COURSE IN TWO-YEARS SECRETARIAL WORK

FRESHMAN YEAR.

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
Modern History (Hist. 7)	2	2	2
College Algebra (Math. 14)	3	3	
Business Correspondence (Sec. 5)			2
Office Practice (Sec. 6)	2	2	2
Shorthand (Sec. 1)	4	4	4
Typewriting (Sec. 3)	4	4	4
Physical Education (Phys. Ed. 1) or Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR.

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
European History (Hist. 1)	3	3	3
Accounting (Sec. 9)	3	3	3
Shorthand (Sec. 2)	3	3	3
Typewriting (Sec. 4)	3	3	3
Commercial Law (Sec. 8)		3	3
Elective	3		
Physical Education (Phys. Ed. 2) or Military Science (Mil. Sci. 2)	1	1	1

COURSE IN ONE-YEAR SECRETARIAL WORK.

A War Emergency Course.

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
Bookkeeping (Sec. 13)	3	3	3
Office Practice (Sec. 6)	2	2	2
Shorthand (Sec. 1)	4	4	4
Typewriting (Sec. 3)	4	4	4
Typewriting (Sec. 14)	2	2	
Business Correspondence (Sec. 5)			2
Physical Education (Phys. Ed. 1) or Military Science (Mil. Sci. 1)	1	1	1

COURSES OF INSTRUCTION.

APPLIED ART.

ASSISTANT PROFESSOR, LANA BALDWIN. INSTRUCTOR, MURIEL MOORE.

The applied art course is outlined to give a thorough training in drawing and in the use of color. The object of the study being to prepare students for studio work as designers, craftsmen, or decorators, and also to prepare them to teach drawing and handicraft in elementary, grammar, and high schools. The course includes the study of line, form, color, historic ornament, principles of design and composition and technical methods in applied design. It insures a broad foundation of art culture and skill which will enable students to make practical use of their training. Exceptional facilities are offered for the study of design and composition and the course is strengthened by the many phases of related art work. Every effort is made to teach drawing. The pupil is then encouraged to follow any line of art work for which he seems best fitted: Applied design, handicraft work or teaching.

1. **Freehand Drawing.** 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Fee $.50. Miss Moore.

Drawing from the cast in charcoal pencil, or pen and ink. Lab. 2 to 4.

1a. **Freehand Drawing.** 3 Q. Autumn, winter, and spring. Continuous. 6 to 12 cr. Fee $.50. Miss Moore.

Continuation of Art 1. Lab. 2 to 4.

1b. **Freehand Drawing.** 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Fee $.50. Miss Moore.

Continuation of Art. 1. Lab. 2 to 4.

2. **Painting.** 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Prerequisite Art 1. Fee $.50. Miss Baldwin.

Water color, oils and tempera. Work from nature and still life. Lab. 2 to 4.

2a. **Painting.** 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Fee $.50. Miss Baldwin.

Continuation of Art 2. Lab. 2 to 4.

3. **Architectural Drawing.** 1 Q. Spring. 4 cr. Fee $.50. Miss Moore.

Drawing from still life and casts. Study of architectural details, and sketching from nature. Work executed in pencil, pen and ink, and charcoal. Lab. 4.

3a. **Architectural Drawing.** 3 Q. Autumn, winter and spring. Continuous. 5 cr. Prerequisite Art 3. Fee $.50. Miss Baldwin.

Continuation of Art 3. Problems in composition and design. Work executed in penclil, charcoal, wash, and color. Lab. 3.

4. Drawing from Nature. 1 Q. Autumn or winter or spring. 2 cr. Fee $.50. Miss Moore.

Pencil, pen and ink, wash and color. Intended especially for students in biology. Lab. 2.

6. History of Art. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Miss Baldwin.

Intended especially for students in design. Historic ornament and the classic styles as exemplified in painting, sculpture and architecture. (Not offered in 1918-1919.) Lect. 3.

7. Design. 2 Q. Autumn and spring. 5 cr. Fee $.50. Miss Baldwin.

Applied design and use of water colors. Students submit original designs. Lab. 2. Lect. 1; lab. 2.

7a. Historic Ornament. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Preerquisite Art 7. Fee $.50. Miss Baldwin.

Historic ornament with analysis of historic examples of design. Original problems executed in black and white and in color. Lab. 2.

7b. Advanced Design. 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Original designs for commercial purposes executed to meet the requirements and conditions of reproduction. Lab. 2.

7c. Advanced Design. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Fee $.50. Miss Baldwin.

Continuation of 7b. Lab. 3.

8a. Embroidery Design. 1 Q. Spring. 2 cr. Fee $.50. Miss Baldwin.

Theory of color and design; original designs for embroidery. Lab. 2.

8b. House Furnishing. 1 Q. Autumn. 3 cr. Fee $.50. Miss Baldwin.

Color, line, and form as applied to house furnishings. Lect. 1; lab. 2.

8c. Decorative Periods. 1 Q. Winter. 3 cr. Prerequisite Art 8b. Fee $.50. Miss Baldwin.

Advanced work in interior decoration. Decorative styles and their adaption to modern uses. Original designs for interiors executed in color. Lect. 1; lab. 2.

9. China Design. 1 Q. Autumn or winter or spring. 2 cr. Fee $.50. Miss Moore.

Applied design for decoration of china; study of color. Lab. 2.

10. Painting on China. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Fee $2; Deposit $4. Miss Moore.

China is fired in the studio. Lab. 2.

11. Leather. 1 Q. Autumn or winter or spring. 2 cr. Prerequisite Art 7. Fee $3. Miss Baldwin.

Tooling, modeling and embossing; also use of dyes and stains for leather. Lab. 2.

Owing to the scarcity of materials due to the war, this course will not be offered until further notice is given. A substitute course in decorative painting will be offered.

12. **Jewelry.** 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Fee $3. Miss Baldwin.

Making of simple and unique jewelry in gold, silver, and in copper. Sawpiercing, enameling, repousse and the setting of semi-precious stones. Lab. 2 to 4.

13. **Metal.** 1 Q. Winter. 2 to 4 cr. Fee $3. Miss Baldwin.

Work in copper, brass, and silver. Raising, sawpiercing, etching, hard and soft soldering and riveting. Given alternate years, 1919-1920. Lab. 2 to 4.

Owing to the scarcity of materials due to the war, this course will not be offered until further notice is given. A substitute course in decorative painting will be offered.

14. **Basketry.** 1 Q. Winter. 2 cr. Fee $3. Miss Baldwin.

Making of baskets of reeds and raffia and other suitable materials. Dyes and dying baskets. Use of native materials in original work in basketry. Lab. 2.

15. **Perspective.** 1 Q. Autumn. 2 cr. Fee $.50. Miss Moore.

Principles of angular and parallel view perspective taught by means of freehand sketches and drawings. Work executed in pencil, pen and ink, wash and color. Lect. 1; lab. 1.

16. **Composition.** 1 Q. Winter. 2 cr. Fee $.50. Miss Moore.

Art structure as a means of expression. Original compositions in light and dark, line and color. Lect. 1; lab. 1.

17. **Practice Work in Teaching.** 1 Q. Autumn or winter or spring. 2 cr. Miss Baldwin.

Teaching drawing, painting, design and handicrafts.

18a. **Methods.** 1 Q. Winter. 3 cr. Fee $.50. Miss Baldwin.

Methods of teaching drawing, painting and design. Lesson plans and materials. Lect. 2; lab. 1.

18b. **Methods.** 1 Q. Spring. 3 cr. Fee $.50. Miss Baldwin.

Methods of teaching the handicrafts; metal, jewelry, leather, basketry, wood block painting, and stenciling. Lesson plans. Materials and equipment. Lect. 2; lab. 1.

19. **Thesis.** 3 Q. Autumn, winter and spring. 12 cr. Fee $1 to $5. Miss Baldwin.

HOME ECONOMICS.

Professor, Lilla Harkins. Assistant Professors, Florence Ballinger, Carlotta Ford. Instructor, Lisa Osterholm. Assistant, Ida Truman.

The object of this course is three-fold. First, to give young women a liberal education with a scientific basis; second, to train them along lines pertaining to the science, management and care of the home;

third, to train those students who wish to follow the work of dietitian or institutional house manager.

In the junior and senior years there is considerable opportunity for electives. These must be taken with the advice and approval of the class officer. Modern language may be elected at this time. Students who wish to specialize in foods and nutrition may elect pure science, advanced food studies and therapeutic cookery. Those who specialize in domestic art may elect art, history and millinery.

1a. Foods. 1 Q. Spring. 3 cr. Fee $2.50. Miss Harkins.

Selection and preparation of foods; food values; marketing and care of food materials. Lab. 3.

1b. Foods. 1 Q. Autumn. 3 cr. Fee $2.50. Miss Harkins.

A continuation of Course 1a. Lect. 1; lab. 2.

2. Food Studies. 1 Q. Spring. 7 cr. Fee $6. Prerequisites Home Economics 1, Chemistry 1, 5, Zoology 3. Miss Ford.

Application of the science underlying the selection and preparation of foods. The dishes prepared illustrate the scientific principles involved. Lect. 3; lab. 4.

3. The House. 1 Q. Winter. 3 cr. Miss Harkins.

Evolution of the home; modern houses; economic problems in furnishing. Taken in connection with house planning. A. E. 7.

4. Economic Problems in Foods. 1 Q. Winter. 2 cr. Fee $4. Miss Harkins.

Menus are planned and meals prepared.

5. Advanced Food Studies. 1 Q. Spring. 3 cr. Fee $4. Prerequisites Home Economics 6, Chemistry 11, Bacteriology 12, Physics 9. Miss Ford.

Detailed study of the food principles correlating closely with the work in bacteriology, physics, chemistry, biology and physiology. Lab. 3.

6. Dietetics. 1 Q. Autumn. 6 cr. Fee $4. Prerequisites Home Economics 2, Chemistry 11, Bacteriology 12. Miss Ford.

Human nutrition and metabolism, the relation of food to health and disease, the construction and preparation of dietaries. Lect. 3; lab. 3.

7. Household Management. 2 Q. Winter and spring. 5 cr. Fee $.50.

Purpose of the household, household income, household accounts and records. During the third quarter the students live in a practice house carrying on the work of a home. Lect. 2; lab. 3.

8. Extension Course. 1 Q. Winter. 4 cr. Fee $3. Miss Harkins.

The theory and practice of food demonstration. Students have an opportunity to do some field work. Lab. 3, field work 1.

9. Home Nursing. 1 Q. Winter. 2 cr.

The care of the patient and sick room in the home. Emergencies. Demonstrations by a graduate nurse. Lect. 1; lab. 1.

10. Home Problems. 1 Q. Winter. 4 to 6 cr. Deposit $.50 to $6. Miss Ford, Miss Ballinger, Miss Harkins.

Individual work is required. The student is given opportunity to carry on original or suggested investigation in food work, or along economic lines pertaining to some phase of the home. Open to seniors only.

11. Clothing. 2 Q. Autumn and winter. 2 cr. Fee $2. Miss Ballinger.

Hand and machine sewing applied to the making of garments. Lab. 2.

11a. Clothing. 1 Q. Spring. 3 cr. Fee $2. Miss Ballinger.

This course is intended for secretarial students. It includes hand and machine sewing with practical application. Attention is given to the choice of suitable materials. Lab. 3.

12. Dressmaking. 1 Q. Spring. 2 cr. Fee $1. Miss Ballinger.

Fundamental principles of dressmaking applied to making simple dresses. Lab. 2.

13. Textiles. 2 Q. Winter and spring. 4 cr. Fee $1. Miss Osterholm.

The historic development of the textile industry and its bearing on the economic life of the nation. A study of standard fabrics with reference to their identification, their price, width and general use, simple household tests to determine pure and adulterated fabrics. Lect. 2; lab. 2.

14. Advanced Dressmaking. 1 Q. Winter. 2 cr. Fee $1. Miss Ballinger.

Principles involved in the use of wool materials and their practical application. Lab. 2.

15. Costume Design. 1 Q. Spring. 5 cr. Fee $3. Miss Ballinger, Miss Osterholm.

Study of design, color and texture suitable for various types of individuals and occasion. Practical application to dress. Lect. 3; lab. 2.

16. Problems in Teaching Sewing. 1 Q. Spring. 2 cr. Fee $1. Miss Ballinger.

Constructive processes. Stitches, seams, finishes, and their relation to sewing problems. Lab. 2.

17. Millinery. 1 Q. Spring. 2 cr. Fee $2. Miss Ballinger.

Construction and trimming of hats. Lab. 2.

18. Advanced Textiles. 1 Q. Spring. 3 cr. Fee $2. Miss Osterholm.

A study of the handicraft movement, clothing budgets in proportion to the family income; chemistry of dry cleaning, dyeing and laundry processes. Lect. 1; lab. 2.

19. Therapeutic Cookery. 1 Q. Winter. 2 cr. Fee $1. Miss Ford.

The food requirements of abnormal cases. Preparation of dietaries. Setting the tray. Lect. 1; lab. 1.

22. Foods. 1 Q. Winter. 4 cr. Fee $4. Miss Harkins.

Course for nurses. Selection and preparation of foods. Marketing and care of food materials. More advanced work is given to students who have had high school courses in cooking. Lect. 1; lab. 3.

23. Dietetics. 1 Q. Spring. 4 cr. Fee $4. Miss Ford.

Course for nurses. A study of the normal nutrition of the family group. Lect. 1; lab. 1.

SECRETARIAL STUDIES

PROFESSOR, R. O. WILSON. INSTRUCTORS, J. R. LIBBY, THEDA JONES.

The secretarial course requires fifteen units of preparation and extends through four years. The technical work is planned to be directly applicable to business, and broad enough to serve as a basis for such positions as private secretary, office manager, etc.

The course includes a thorough grounding in English, and at least one modern language—French, German or Spanish, together with work in science, history, and social science. Women may elect some work in home economics. The technical work includes business procedure, office management and practice, business law, principles of accounting, principles underlying business activities, business statistics, shorthand and typewriting.

The degree Bachelor of Science is conferred upon students who have completed satisfactorily the prescribed four-years college course in secretarial work.

The two-years secretarial course is intended for those who cannot take the time to complete a four-years course. The completion of a high school course or its equivalent is required for entrance.

The one-year secretarial course is a war emergency course to help meet the present demands for office help. The completion of a high school course or its equivalent is required for entrance.

1. Shorthand. 3 Q. Autumn, winter and spring. Continuous. 12 cr. Miss Jones.

Fundamental principles of shorthand practice in word building, phrasing and dictation. Lect. 4.

2. Shorthand. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Miss Jones.

Practice in writing letters, legal papers, testimony, and miscellaneous matter. Students who take this course will also take secretarial 4. Lect. 3.

3. Typewriting. 3 Q. Autumn, winter and spring. Continuous. 12 cr. Fee $1. Miss Jones.

Use and care of typewriters. Exercises for the development of proper wrist and finger movements, and for the mastery of the key board. Practice in letter writing and the use of carbon. Lab. 4.

4. Typewriting. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Fee $.50. Miss Jones.

Practice in transcribing from shorthand notes and from manuscript. Dictation for the attainment of speed and accuracy; practice in the use of the mimeograph. Students who take this course will also take secretarial 2. Lab. 3.

5. Business Correspondence. 1 Q. Spring. 2 cr. Mr. Wilson.

A practical course in business correspondence. Lect. 2.

6. Office Practice. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Wilson.

Practice with various kinds of office appliances and equipment, such as adding machines, addressing machines, filing, etc. Lect. 1; lab. 1.

7. Economics of Business. 2 Q. Autumn and winter. 4 cr. Mr. Libby.

This course offers a general survey of the principles underlying business activities. Lect. 2.

8. Commercial Law. 2 Q. Winter and spring. 6 cr. Mr. Libby.

Students will be required to familiarize themselves with the rights and liabilities of parties to common business transactions, as contracts, sales, deeds, mortgages; and with the drawing up and the validity of commercial paper and contracts. Text and cases. Lect. 3.

9. Principles of Accounting. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Libby.

Principles underlying accounting in general. Laboratory exercises. Lect. 1; lab. 2.

11. Shorthand. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Miss Jones.

Advanced course, including special dictation practice for gaining speed. When possible, opportunity will be given to assist in the actual work of an office. Students who take this course will also take secretarial 12. Lect. 2.

12. Typewriting — Rapid Dictation. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Fee $.50. Miss Jones.

Additional practice in transcribing from shorthand notes, also copying work for gaining speed on the machine. In addition to regular class work in courses 11 and 12, eighty hours of actual office practice will be required of each student, during the senior year. Students who take this course will also take secretarial 11. Lab. 3.

13. Bookkeeping. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Libby.

A foundation course. Accounts pertaining to various forms of business are kept. Lect. 1; lab. 2.

14. Typewriting. 2 Q. Autumn and winter. 4 cr. Fee $.50. Miss Jones.

Additional work in typewriting. This course supplements secretarial 3, and is planned primarily for students in the one-year secretarial course. Lab. 2.

20. Business Statistics. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Libby.

Statistical principles and methods. Uses of statistics in business. Assigned problems. Lect. 2.

Courses in Vocational Education

Courses for the preparation of high school teachers and leaders in the various fields of agricultural, industrial and home economics education are offered according to the Federal plan for vocational education under the provisions of the Smith-Hughes Act of Congress passed in February, 1917.

The work is so arranged in kind and quantity as to make it possible for students, who desire a general course in agriculture, manual arts and home economics, to obtain such a course and at the same time secure a preparation, which will enable them to qualify as teachers of these subjects and for extension work. Three separate courses, each providing four years' instruction, have been provided for persons who desire to fit themselves for the work indicated above.

A present and growing need in Montana is for men who have had special training for county agent and demonstration work. The time is not far distant, when every county in the state will demand an agricultural specialist, one who will assist farmers in matters of organization, co-operation, pure bred stock and a more scientific cultivation of the soil. Students who are preparing for this work will be given an opportunity to visit counties where agents are employed, take in extension schools, study the methods of the different extension specialists at the college, and under the direction of the department and State county agent leader prepare extension projects. In so far as possible, the student in his preparation will meet the problems which he will later meet in the field.

The special training begins with the junior year in each course. The freshman and sophomore years in the agricultural courses prepare for the junior year of the course in Agricultural Education and Extension Methods. The freshman and sophomore years in the applied science courses will be accepted when they include not less than sixteen credits of agriculture. The freshman and sophomore years in home economics prepare for the junior year of the Teachers' Course in Home Economics. The freshman and sophomore years in any of the engineering courses prepare for the junior year in the Teachers' Course in Trades and Industry.

COURSE IN AGRICULTURAL EDUCATION AND EXTENSION METHODS.

JUNIOR YEAR.

	Autumn	Winter	Spring
Economics (Econ. 3)	3		
Agricultural Economics (Econ. 6)		3	
Soil Physics (Agron. 2)	4	3	
Breeds of Livestock (An. Husb. 2a)		4	
Breeds of Livestock (An. Husb. 2a)			5
Nutrition of Farm Animals (An. Husb. 4a)	5		
Development of Vocational Education (Ed. 3)			3
Psychology (Ed. 1)	3		
Rural Life Problems (Ed. 8)		4	
Woodwork (M. E. 2b)	2		
Common Diseases (Vet. Sci. 57)		5	
Rural Sociology (Soc. 7)			3
Elective	2		8

SENIOR YEAR.

Principles of Breeding (Agron. 7)	6		
Beef Cattle and Sheep Production (An. Husb. 7)		4	
Teaching Practice (Ed. 7)	3	3	3
Farm Management (Agron. 6)	6		
Secondary Agricultural Education (Ed. 6)		4	
Cooperation and Extension Methods in the Field (Ed. 10)			3
Theory and Practice of Teaching (Ed. 5)	3		
Agricultural Cooperation and Extension Methods (Ed. 9)		4	
Poultry Management (Poult. 41)		4	
Thesis (Ed. 16)			2
Elective			11

COURSE IN HOME ECONOMICS VOCATIONAL TRAINING.

JUNIOR YEAR.

	Autumn	Winter	Spring
Bacteriology (Bact. 12)	6		
Sanitary Bacteriology (Bact. 13)		3	
Educational Psychology (Ed. 4)		3	
Costume Design (H. E. 15)			5
Home Nursing (H. E. 26)		2	
House Furnishings (Art 8b)	3		
Economic Problems in Foods (H. E. 4)		2	
History of Vocational Education (Ed. 2)			3
Psychology (Ed. 1)	3		
House Management (H. E. 7)		2	3
Advanced Dressmaking (H. E. 14)		2	
Physiological Chemistry (Chem. 11)			5
Elective	7	5	3

SENIOR YEAR.

Education of Women (Ed. 13)	3		
Teaching Practice (Ed. 7a)		3	3
Dietetics (H. E. 6)	6		
Theory and Practice of Teaching (Ed. 5)	3		
Extension Course (H. E. 21)		4	
Problems in Teaching Home Economics (Ed. 14)			1
Special Methods in Home Economics (Ed. 12)	3		
Home Problems (H. E. 10)		4	
Sociology (Soc. 4)			3
Elective	4	8	12

Elective for Junior and Senior years: Home Economics (3), (16), (19); Chemistry (4); English (6), (10); History (1), (2), (5); Poultry (7); Art (6), (7b), (7c), (14), (15), (16); Modern Language and Music; Trades and Industry (11).

COURSE IN TRADES AND INDUSTRY.

JUNIOR YEAR.

	Autumn	Winter	Spring
Industrial History (Hist. 10)	3	3	3
Economics (Econ. 3)	3	3	
Cabinet Work (T. I. 3)			3
Carpentry (T. I. 1)	3		
Carpentry (T. I. 2)		3	
Plumbing and Steam Fitting (M. E. 36)	2	2	
Pattern Work (T. I. 6)			3
Foundry (T. I. 4)	2		
Foundry (T. I. 5)		2	
Machine Design (M. E. 13)			4
Psychology (Ed. 1)	3		
Shop Management (T. I. 8)		3	
Industrial Organiaztion and Management (T. I. 9)			3
Industrial Accounts (T. I. 7)	3		
Machine Design (M. E. 13)		3	
Development of Vocational Education (Ed. 3)			3

SENIOR YEAR.

Electrical Machinery (E. E. 1)	3		
Electrical Power (E. E. 14)		4	
Electrical Power (E. E. 14a)			4
Applied Mechanics (C. E. 6a)	3		
Concrete Construction (C. E. 44)		3	3
Gas Power (M. E. 22a)	3		2
Steam and Gas (M. E. 7)		3	
Mechanical Laboratory (M. E. 15a)		2	
Machine Work (M. E. 21)	4		
Principles of Teaching Trades and Industry (Ed. 15)		3	
Heat Power (M. E. 18a)			3
Principles of Teaching (Ed. 15)	3		
Teaching Practice (Ed. 7b)		3	3
Experience in Local Industries (T. I. 10)	3		3

COURSES OF INSTRUCTION.

EDUCATION.

PROFESSORS, M. J. ABBEY (Director), LILLA HARKINS. ASSISTANT PROFESSORS, ALFRED LIVINGSTON, RALPH T. CHALLENDER.

The courses offered in this department are given by the specialists in vocational education and provide the theory and some practice for the students who are preparing to teach agriculture, home economics, and the industries in the secondary schools. Other subjects included in the teachers' courses are to be found amond the several departments.

All the equipment of the agricultural departments, including the farms, barns, livestock, and laboratories, the shops and engineering apparatus, and the kitchen laboratories, and sewing rooms of the home economics department are available.

So far as possible, opportunity will be given for observation and practice teaching. For this purpose the secondary schools in agriculture, home economics and mechanic arts at the college will be used. The Gallatin County High School and Bozeman City Schools offer some advantages.

1. Psychology. 1 Q. Autumn. 3 cr. Mr. Livingston.

General view of modern psychology, methods and materials of psychological investigation.

2. History of Vocational Education. 1 Q. Spring. 3 cr. Mr. Livingston.

A brief survey of industrial education prior to 1800, some of the most significant developments during the nineteenth century, and the present status and need, including a brief study of vocational guidance. For home economics students.

3. Development of Vocational Education. 1 Q. Spring. 3 cr. Mr. Livingston.

Offered to students in agricultural education and extension methods.

4. Educational Psychology. 1 Q. Winter. 3 cr. Mr. Livingston.

Continuation of course 1, but considered from the standpoint of the studies of the curriculum. This will include some genetic and experimental psychology.

5. Theory and Practice of Teaching. 1 Q. Autumn. 3 cr. Mr. Livingston.

A study of the aims of education, the fundamentals of teaching, the recitation, class management, and the use of scales.

6. Secondary Agricultural Education. 1 Q. Winter. 4 cr. Mr. Abbey.

For students preparing to teach agriculture in the high schools. Organization of the class, equipment, laboratory instruction, field excursions, experimental plats, community work and agricultural clubs.

7. Teaching Practice in Agriculture. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Abbey.

The preparation of lesson plans and outlines with an opportunity to observe and teach classes in secondary agriculture.

7a. Teaching Practice in Trades and Industry. 2 Q. Winter and spring. 6 cr. Mr. Abbey.

Preparation of lesson plans and outlines with an opportunity to observe and teach classes.

7b. Teaching Practice in Home Economics. 2 Q. Winter and spring. 6 cr. Mr. Abbey.

Preparation of lesson plans and outlines with an opportunity to observe and teach classes.

8. Rural Life Problems. 1 Q. Winter. 4 cr. Mr. Abbey.

The fundamental problems of rural life, social, political, religious, and educational agencies and methods of correlation. As the basis of the course, a survey of a typical rural community will be made.

9. Agricultural Cooperation and Extension. 1 Q. Winter. 4 cr. Mr. Abbey.

Practical preparation for county agent work and in modern methods of cooperative enterprise in agriculture.

10. Cooperation and Extension Methods in the Field. 1 Q. Spring. 3 cr. Mr. Abbey.

The practical part of course 9. Students will be required to do field work with county agents and specialists. Students will assist in extension schools and community meetings.

11. Supervision. 3 Q. Autumn, winter and spring. Continuous. 1 cr. Mr. Abbey.

A course in supervision and follow-up instruction for teachers of agriculture in schools receiving aid under the provisions of the Smith-Hughes Act and supplementary State Legislature.

12. Special Methods in Home Economics. 2 Q. Autumn and winter. 6 cr. Miss Harkins.

Theory and practice of teaching domestic science and domestic art. Study is made of courses in various types of institutions. Courses of study are planned for graded schools, high schools and colleges. Lesson plans are given especial attention. Lect. 3; lab. 1.

13. Education of Women. 1 Q. Autumn. 3 cr. Miss Harkins.

Survey of women's education, origin, and development of home economics.

14. Problems in Teaching Home Economics. 1 Q. Spring. 1 cr. Miss Harkins.

A review of the special problems which a teacher will meet in elementary and secondary courses in home economics.

15. Principles of Teaching Trades and Industry. 2 Q. Autumn and winter. 6 cr. Mr. Challender.

The aims of education as they apply to the teaching of trades and industry subjects. Methods of organizing and conducting day and part time classes. Correlating school instruction with the present day economic demands.

16. Thesis. 1 Q. Spring. 2 cr.

Each student in the department of vocational education must present a suitable thesis upon some subject relating to his course. The subject to be chosen early in the senior year after consultation with his class adviser.

TRADES AND INDUSTRY.

Assistant Professor, R. T. Challender. Instructor, F. Kately.

1. Carpentry. 1 Q. Autumn. 3 cr. Prerequisite Mechanical Engineering 2. Fee $3. Mr. Challender.

Framing and rafter cutting. Special application is made of the subjects of plane geometry and descriptive geometry in the formulation of rafter cutting rules, which by means of the steel square are applied in the framing of model structures and roofs.

2. Carpentry. 1 Q. Winter. 3 cr. Prerequisite Trades and Industry 1. Fee $3. Mr. Challender.

Continuation of Trades and Industry 1 with instruction in the use and care of special hand tools and power machines in the construction of window and door frames and interior finish. A study is made of the different styles of interior trim and arrangement of built-in fixtures.

3. Cabinet Work. 1 Q. Spring. 3 cr. Prerequisite Mechanical Engineering 2. Fee $1. Mr. Challender.

Study is made of courses of instruction suitable for grade and high school use in wood work, and in the proportion and design of standard projects in wood. Instruction and care of wood working machines as applied to school use is emphasized. Written reports will be required on current articles dealing with the subjects enumerated above and such subjects as stains, varnishes, glues and paints. Lect. 2; lab. 1.

4. Foundry. 1 Q. Autumn. 2 cr. Prerequisite Mechanical Engineering 4. Fee $2. Mr. Kately.

Continuation of Mechanical Engineering 4. Advanced work in moulding and core work with practical instruction and practice in the handling of the cupola and brass furnace.

5. Foundry. 1 Q. Winter. 2 cr. Prerequisite Trades and Industry 4. Fee $2. Mr. Kately.

In this course the student is expected to take charge of the cupola during the running of heats. Practical plans for equipment and arrangement of foundries will be studied and written reports on current articles will be required.

6. Pattern Work. 1 Q. Spring. 3 cr. Prerequisite Mechanical Engineering 2a. Fee $3. Mr. Challender.

Continuation of Mechanical Engineering 2a. Advanced work in the construction of patterns and match board work, together with a study of the methods employed in large pattern shops in the marking and storage of patterns.

7. Industrial Accounts. 1 Q. Autumn. 3 cr. Mr. Challender.

Theory of accounts, good will, depreciation, surplus and reserves, sinking fund, cost keeping, and capital stock issued for cash and property. Lect. 3.

8. Shop Management. 1 Q. Winter. 3 cr. Prerequisites Trade and Industry 7. Mr. Challender.

Instruction in the methods of scientific management in a factory, scientific time study, foremanship, the task idea, wages, standards for measuring efficiency and work planning. Lect. 3.

9. Industrial Organization and Management. 1 Q. Spring. 3 cr. Prerequisite Trades and Industry 8. Mr. Challender.

Selection of a locality for a shop or factory; the grouping of buildings; selection and arrangement of equipment; a study of the division of labor, and the overhead cost or non-productive expense are considered. Lect. 3.

10. Experience in Local Industries. 2 Q. Autumn and Spring. 6 cr. Mr. Challender.

With the cooperation of local concerns and with their supervision, practical work will be offered in planing mills, plumbing shops and electrical shops. A grade of work satisfactory to the employer and the instructor in charge of the course will be required. Courtesy, obedience to orders, interest in the work, and the quality of the work done, are some of the determining factors.

11. Manual Training. 2 Q. Winter and Spring. 4 cr. Fee $4. Mr. Challender.

Intended for college women who signify their intention of teaching. A limited number of city and rural teachers may take this work. Use and care of hand tools in the making of a graded series of practical projects with emphasis on finishing the same. A study of the various woods, stains, fillers and varnishes suitable for school use. Assignments in current topics.

Course for Nurses

It is the purpose of the State College of Agriculture and Mechanic Arts of the University of Montana to conduct a one-year course for the thorough, scientific training of the nurse.

This is best assured by the cooperation of the State College and the accredited training schools for nurses. It is the desire, also of the college to make it the means of advancing the education of nursing women in Montana.

This course invites to matriculation, women of superior education and of large and earnest purpose, but most earnestly seeks the young woman, who having finished her high school course, wishes to take the three years training to become a registered nurse.

The State College is cooperating with some of the best known hospitals of the state, and at the end of one year's scientific training and the study in the laboratories, lectures, classes, and demonstrations, in the State College, the training schools will receive the successful student for two years practical work in the hospital.

The three years of work thus outlined leads to nursing work in private cases, laboratories, operating rooms; public health, X-ray work; office and school nurses.

The student showing organizational ability may prepare for the positions of hospital superintendents and managers.

There is a distinct advantage in taking the scientific work as outlined, as a preparation for the practical work, as this gives the student an opportunity of institutional training in their everyday living as the students registering for this course will live in Hamilton Hall and share in the social training with the other college women.

COURSE FOR NURSES.

A War Emergency Course.

English Composition (Eng. 11)	3		
Modern History (Hist. 7)	2	2	2
General Chemistry (Chem. 1)	6	6	
Elementary Bacteriology (Bact. 15)			5
Invertebrate Zoology (Zool. 1)	6		
Human Physiology and Anatomy (Zool. 3)		6	
Organic Chemistry (Chem. 5)			6
Foods (H. E. 22)		3	
Dietetics (H. E. 23)			4
Physical Education (Phys. Ed. 3)	2	2	2

Courses in General

ECONOMICS AND SOCIOLOGY.

PROFESSOR, J. M. HAMILTON (President).

3. Economics. 2 Q. Autumn and winter. 6 cr.

Principles of economic science. Study of such questions as labor and capital, banking, transportation and taxation. Lect. 3.

4. Sociology. 1 Q. Spring. 3 cr.

Introduction to sociology. Attention given to the problems of marriage and divorce, immigration, race questions, charities and corrections, pauperism and crime. Lect. 3.

5. Engineering Economics. 1 Q. Spring. 3 cr. Prerequisite Economics 3.

Study of economic questions of immediate interest to engineers and others engaged in the industries. Lect. 3.

6. Agricultural Economics. 1 Q. Winter. 3 cr. Prerequisite Economics 3.

Agricultural economic problems; value and rent of land; agricultural labor; rural credit; cooperative associations. Lect. 3.

7. Rural Sociology. 1 Q. Spring. 3 cr. Prerequisite Sociology 4.

Rural social problems; rural health; country church; rural schools; roads; recreations, etc. Lect. 3.

ENGLISH.

PROFESSOR, W. F. BREWER, MRS. UNA B. HERRICK (Dean). ASSISTANT PROFESSOR, E. A. DUDDY. INSTRUCTORS, MIGNON QUAW, GEORGIA CUBINE, JESSIE DONALDSON, MR. G. S. POWELL.

In all the courses in English, written work plays an important part. That this work may be kept up to the proper grade, it is announced here that in college English work no paper will receive any credit that shows notable carelessness or ignorance in elementary matters of punctuation, grammar, rhetoric, or in the spelling of common words.

1. English Composition. 1 Q. Autumn; winter. 3 cr. Mr. Duddy, Miss Cubine, Miss Donaldson.

1a. English Composition. 1 Q. Winter; spring. 3 cr. Mr. Duddy, Miss Cubine, Miss Donaldson.

1b. English Composition. 1 Q. Spring. 3 cr. Mr. Duddy, Miss Cubine, Miss Donaldson.

English 1, 1a, 1b. Required of all freshmen. Rhetoric and types of prose composition; narration, description, exposition, and argumentation.

2. Expository Composition. 1 Q. Autumn; winter. 2 cr. Mr. Brewer.

2a. Expository Composition. 1 Q. Winter; spring. 2 cr. Mr. Brewer.

2b. Expository Composition. 1 Q. Spring. 2 cr. Mr. Brewer.

English 2, 2a, 2b are intended for students who will go into scientific or technical work; with a steady practice in writing, a considerable variety of reading is required throughout the year. Practice in the use of the library. Three or more sections.

3. Advanced English Composition. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Brewer.

Open to juniors and seniors. Systematic reading. Methods of the course will be varied to suit the immediate purpose of those who elect it.

5. Argumentation and Forms of Public Address. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Duddy.

Principles of argumentation; briefs and debates. Some study of the forms of public address with written and oral practice. Elective for seniors, juniors, and sophomores who have credit for courses 1 and 2. At the pleasure of the instructor, sophomores who are taking course 2 may also elect course 5.

6. The Modern Drama. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Prerequisite English 1. Mr. Herrick.

Survey of the modern drama in Europe and America, with emphasis on influence of Ibsen and Shaw. Elective for juniors and seniors. With the consent of the instructor it may be taken in any quarter separately.

10. English Literature. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Brewer.

General survey course. Large amount of reading is required and more recommended. Written reports. Class room critical reading of English masterpieces. Lectures, recitations and conferences.

11. English Composition. 1 Q. Autumn. 3 cr. Mr. Duddy.

For students taking the course for nurses.

FRENCH AND SPANISH.

INSTRUCTOR, FLORENCE WALLIN.

1. French. 3 Q. Autumn, winter and spring. Continuous. 12 cr.

Elements of grammar based on Fraser and Squairs' French Grammar, with constant practice in pronunciation, dictation and conversation. Reading of easy texts.

2. French. 3 Q. Autumn, winter and spring. Continuous. 12 cr.

Review of grammar. Typical fiction and dramas of the nineteenth century. Advanced composition and original theme writing. Conversation and dictation.

3. French. 3 Q. Autumn, winter and spring. Continuous. 9 cr.

Study of classical and modern dramas and novels. Masterpieces of Corneille, Moliere, Racine, Rostand, Hugo and Balzac. Collateral reading and reports.

20. Spanish. 3 Q. Autumn, winter and spring. Continuous. 12 cr.

Elements of grammar with conversation and special emphasis on pronunciation. Reading of short stories and easy novels.

21. Spanish. 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Reading of modern novelists and dramatists. Conversation and composition.

GEOLOGY.

ASSISTANT PROFESSOR, E. J. QUINN.

The subjects of mineralogy and geology are important not only to the student of general science, but also to those who are specializing along some particular applied line. Here the student of agriculture gains an insight into the nature of soil as merely one particular phase of the broader subjects of rock formation, and disintegration, and from his knowledge of rocks, rock forming minerals, and the changes which these minerals undergo gains the ability to classify soils in a systematic manner. The engineer is enabled both to distinguish between the various types of rocks and minerals, and also to foresee how a given constructive material will withstand various conditions of weathering, and other destructive agents. The science student, in any field, finds in geology and mineralogy a history of the nature and origin of all the materials with which he comes in contact, and having command of such data he approaches his subject in a well prepared and intelligent manner.

The department museum, containing an excellent collection of minerals, rocks, and fossils, is constantly drawn upon for illustrative material. In addition, the publications of the United States Geological Survey are at the command of the student, and are used as reference in connection with special topics.

1. General Geology. 1 Q. Winter. 4 cr. Prerequisite Chemistry 1.

Application of the science to agriculture and engineering. Rocks and rock forming minerals and their classification. A trip to Morrison Cave, an interesting formation lying about fifty miles west of Bozeman, will be included in the field work. Lect. 4.

2. Mineralogy. 2 Q. Autumn and spring. 6 cr. Prerequisite Chemistry 1. Fee $3; Deposit $3.

Chrystallography, and the classification and identification of the more important minerals and rocks. Lect. 2; lab. 1.

GERMAN.

ASSISTANT PROFESSOR, CARRIE CEHRS.

1. **Elementary German.** 3 Q. Autumn, winter and spring. Continuous. 12 cr.

Grammar and easy readings, with practice in speaking and writing German. Open to college students who have not had high school or preparatory German.

2. **Intermediate German.** 3 Q. Autumn, winter and spring. Continuous. 12 cr. Prerequisite German 1.

Modern prose, narrative and dramatic. Grammar review and elementary syntax, written and oral exercises.

3. **Advanced Freshman German.** 3 Q. Autumn, winter and spring. Continuous. 12 cr.

Classical and modern writers. Selected works of Schiller, Heine, Freytag, Sudermann and others. Conversation, composition and syntax. Open to freshmen who have had two years of high school German.

4. **Classics of the Eighteenth Century.** 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Masterpieces of Lessing, Goethe and Schiller. (Omitted in 1918-1919.)

5. **Modern German Dramatists.** 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Selected dramas of Grillparzer, Hebbel, Sudermann, Hauptmann, and others. A rapid reading course. (Given in 1918-1919.)

6. **Scientific German.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Prerequisites German 1,2.

For students specializing in science. Rapid reading of scientific prose.

HISTORY.

ASSISTANT PROFESSOR, HELEN R. BREWER.

1. **European History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr.

The development of modern Europe. Use of the library with lectures on historical methods.

2. **Medieval History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Alternates with History 5.

First two quarters a text book is used; last quarter on the Italian Renaissance topical references to the library and pictures. (Not given in 1918-1919).

5. **American History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Prerequisite History 1. Alternates with Medieval History 2.

United States history covering the period of constitutional development. Use of the library is required, and the student is expected to spend about one-fourth time in the preparation of a paper.

7. Modern History. 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Current events, a review of the political and industrial development of the last few decades.

10. Industrial History. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Prerequisite History 1.

Outlines of United States industrial history. Each quarter the student will write a paper on some special line of industry which he either reads upon or personally investigates.

Society 1898 to date); also about 200 volumes of recent treatises on mathematics. It may also be mentioned that the library is especially well equipped with treatises and journals of applied mathematics found in the libraries of the engineering and physics departments.

1. Engineering Mathematics. 1 Q. Autumn. 5 cr. Mr. Tallman.

The first three-fifths of the quarter the work given is plane trigonometry. The remainder of the quarter is devoted to college algebra. The work of this quarter and about half of the following quarter covers a review of radicals and quadratic equations, progressions, binomial theorem, theory of limits, undetermined coefficients, infinite series, permutations and combinations, probability and an introduction to the theory of equations.

2. Engineering Mathematics. 1 Q. Winter. 6 cr. Mr. Tallman.

Half of the quarter is devoted to the continuation of the algebra started in the first quarter and the remainder of the time is devoted to analytical geometry.

3. Engineering Mathematics. 1 Q. Spring. 6 cr. Mr. Tallman.

Continuation of analytical geometry and work in calculus covering "Woods & Bailey" course in mathematics, Vol. I, with the exception of the last three chapters. This book is used as a text.

4. Engineering Mathematics. 1 Q. Autumn. 6 cr. Mr. Tallman.

"Woods & Bailey" Vol. I is completed and the subjects of integral calculus, solid analytical geometry, elements of differential equations are given substantially as in Vol. II in this course and course 5.

5. Engineering Mathematics. 1 Q. Winter. 6 cr. Mr. Tallman.

Continuation of course 4.

6. Astronomy. 1 Q. Spring. 3 cr. Prerequisites Physics 1, Mathematics 4, 5. Mr. Tallman.

GERMAN.

ASSISTANT PROFESSOR, CARRIE CEHRS.

1. **Elementary German.** 3 Q. Autumn, winter and spring. Continuous. 12 cr.

Grammar and easy readings, with practice in speaking and writing German. Open to college students who have not had high school or preparatory German.

2. **Intermediate German.** 3 Q. Autumn, winter and spring. Continuous. 12 cr. Prerequisite German 1.

In accordance with the order of the State Council of Defense there will be no instruction in German during the year 1918 1919.

Open to freshmen who have had two years of high school German.

4. **Classics of the Eighteenth Century.** 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Masterpieces of Lessing, Goethe and Schiller. (Omitted in 1918-1919.)

5. **Modern German Dramatists.** 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Selected dramas of Grillparzer, Hebbel, Sudermann, Hauptmann, and others. A rapid reading course. (Given in 1918-1919.)

6. **Scientific German.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Prerequisites German 1,2.

For students specializing in science. Rapid reading of scientific prose.

HISTORY.

ASSISTANT PROFESSOR, HELEN R. BREWER.

1. **European History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr.

The development of modern Europe. Use of the library with lectures on historical methods.

2. **Medieval History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Alternates with History 5.

First two quarters a text book is used; last quarter on the Italian Renaissance topical references to the library and pictures. (Not given in 1918-1919).

5. **American History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Prerequisite History 1. Alternates with Medieval History 2.

United States history covering the period of constitutional development. Use of the library is required, and the student is expected to spend about one-fourth time in the preparation of a paper.

7. Modern History. 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Current events, a review of the political and industrial development of the last few decades.

10. Industrial History. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Prerequisite History 1.

Outlines of United States industrial history. Each quarter the student will write a paper on some special line of industry which he either reads upon or personally investigates.

MATHEMATICS.

Professor, W. D. Tallman. Instructors, Frieda Bull, Annie Breneman.

The students in this department have access to the following journals: American Journal of Mathematics (complete set); Annals of Mathematics (from 1900); Bulletin of American Mathematical Society 1898 to date); also about 200 volumes of recent treatises on mathematics. It may also be mentioned that the library is especially well equipped with treatises and journals of applied mathematics found in the libraries of the engineering and physics departments.

1. Engineering Mathematics. 1 Q. Autumn. 5 cr. Mr. Tallman.

The first three-fifths of the quarter the work given is plane trigonometry. The remainder of the quarter is devoted to college algebra. The work of this quarter and about half of the following quarter covers a review of radicals and quadratic equations, progressions, binomial theorem, theory of limits, undetermined coefficients, infinite series, permutations and combinations, probability and an introduction to the theory of equations.

2. Engineering Mathematics. 1 Q. Winter. 6 cr. Mr. Tallman.

Half of the quarter is devoted to the continuation of the algebra started in the first quarter and the remainder of the time is devoted to analytical geometry.

3. Engineering Mathematics. 1 Q. Spring. 6 cr. Mr. Tallman.

Continuation of analytical geometry and work in calculus covering "Woods & Bailey" course in mathematics, Vol. I, with the exception of the last three chapters. This book is used as a text.

4. Engineering Mathematics. 1 Q. Autumn. 6 cr. Mr. Tallman.

"Woods & Bailey" Vol. I is completed and the subjects of integral calculus, solid analytical geometry, elements of differential equations are given substantially as in Vol. II in this course and course 5.

5. Engineering Mathematics. 1 Q. Winter. 6 cr. Mr. Tallman.

Continuation of course 4.

6. Astronomy. 1 Q. Spring. 3 cr. Prerequisites Physics 1, Mathematics 4, 5. Mr. Tallman.

Spherical astronomy with an introduction to some celestial mechanics.

7. **Elementary Analysis.** 1 Q. Autumn. 4 cr. Mr. Tallman.

Elementary concepts of analytical geometry and calculus of importance to students of the natural sciences and the application of the same to practical problems.

8. **Trigonometry and Logarithms.** 1 Q. Autumn; spring. 4 cr. Mr. Tallman.

9. **College Algebra.** 1 Q. Spring. 5 cr.

Covers the ground given to algebra in Mathematics (1), (2).

10. **Differential Equations.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Tallman.

Ordinary and partial differential equations with geometrical and mechanical applications.

11. **Partial Differential Equations of Mathematics-Physics.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Tallman.

Course based on Weber's "Die Partiellen Differential Gleichungender Mathematischen Physik," and Byerley's "Spherical Harmonics."

12. **Theory of Least Squares and Probable Error.** 1 Q. Spring. 3 cr. Prerequisites Mathematics 4, 5. Mr. Tallman.

13. **Statistics.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Prerequisites Mathematics 4, 7. Mr. Tallman.

Theory of probability, general methods of statistical investigation, application of the theory of probability to statistical data, fitting curves to observations, interpolation, theory of errors, mathematical theory of variation and correlation and application of the principles developed to problems in biology, sociology and economics.

14. **College Algebra.** 2 Q. Autumn and winter. 6 cr. Miss Bull, Miss Breneman.

For secretarial students.

15. **Mathematical Theory of Investments.** 1 Q. Spring. 3 cr. Prerequisites Mathematics 2, 7 or 15. Mr. Tallman.

Courses 3, 4, 5, will be repeated in other quarters than scheduled if demanded by six or more students. During the fourth quarter such of the above courses will be offered only when sufficient numbers of students demand them. Should there be a demand during the fourth quarter a 12 credit course covering 2 and 3 or one covering 4 and 5 may be offered.

MILITARY SCIENCE.

PROFESSOR, CAPTAIN H. C. CLARK. INSTRUCTOR, ...

An infantry unit, senior division, of the Reserve Officers' Training Corps has been established at this college by the President of the United States, under the provisions of the National Defense Act of 1916. The primary object is to qualify, by systematic and standard

methods of training, students at civil educational institutions for reserve officers, this to be done with the least practicable interference with their civil careers. An officer of the army is detailed by the War Department as Professor of Military Science and Tactics; he also acts as Commandant of Cadets.

By law the military course is compulsory for all physically fit male students, not aliens, during their first two years; the minimum time required is three hours per week, and satisfactory completion of the course is a prerequisite for graduation. The military course is optional for students after their sophomore year; those who elect to continue must agree in writing to continue in the Reserve Officers' Training Corps during the remainder of their course in college, to devote five hours per week to it, and to pursue the courses of camp training that may be prescribed by the Secretary of War. In consideration of this agreement the government purposes to pay the cadet so electing to continue his military studies a sum of money not to exceed the cost of the garrison ration; this is now approximately thirty cents a day. Cadets completing the four-years military course will be eligible for appointment in the army as temporary second lieutenant for six months, with a pay of $100 per month and allowances of a regular second lieutenant. The graduate will also be eligible for appointment as a reserve officer.

The college is put to no expense for the military instruction other than proper housing for indoor drill and for government property furnished. The government furnishes the necessary services of officers and non-commissioned officers, and uniforms and equipments for the cadets.

1. **Military Science.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Captain Clark.

(a) Practical. Physical drill; infantry drill, close and extended order; gallery practice; care of rifle and equipment.

(b) Theoretical. Theory of target practice; military organization; map reading; security; hygiene.

(c) Practical. Physical drill; infantry drill; intrenchments; first aid; target practice.

(d) Theoretical. Lectures; general military policy and obligations of citizenship; service of information; combat; infantry drill; camp sanitation.

2. **Military Science.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Captain Clark.

(a) Practical. Combat firing if practicable.

(b) Theoretical. Infantry drill regulations; small-arms firing regulations; lectures as in course 1 (d); map reading; camp sanitation and camp expedients.

(c) Practical. Signaling; first aid; intrenchments, field works, obstacles, bridges, etc; range practice.

(d) Theoretical. Lectures, recent military history; small tactical problems; marches and camps.

3. Military Science. 3 Q. Autumn, winter and spring. Continuous. 3 cr. Captain Clark.

(a) Practical. Duties consistent with rank. Military sketching.

(b) Theoretical. Minor tactics; field orders; map maneuvers; company administration; military history.

(c) Practical. Military sketching.

(d) Theoretical. Minor tactics continued; map maneuvers; elements of international law; property accountability.

4. Military Science. 3 Q. Autumn, winter and spring. Continuous. 3 cr. Captain Clark.

(a) Practical. Duties consistent with rank. Military sketching.

(b) Theoretical. Tactical problems, small forces; court-martial proceedings; international relations of America; general principles of strategy. Open to students ranking as seniors in the college.

(c) Practical. Same as (a)

(d) Theoretical. Tactical problems continued; map maneuvers; rifle in war. Lectures on military history and policy. Open to students ranking as seniors in the college.

MUSIC.

Professors, A. H. Currier, G .W. Nash. Instructors, June Hartman, F. Jackson, L. Howard.

There is a universal demand that education in music shall be provided for in schools and colleges. Some knowledge of applied music is coming to be more and more a part of liberal culture and the valuable influence of good music in family and social life needs no discussion.

Accordingly the department of music offers to students of the college and others opportunity to pursue under competent instructors the main branches of music study.

Tuition is payable to the secretary of the college in advance. No reduction will be made for absence from lessons. Teachers will make up hours they fail to give according to schedule.

Non-resident students of music must be enrolled in other work, so that the total amount is equal in time spent to eighteen credits. For such students is recommended the study of home economics, languages literature, history, and art.

The department is closed on the college and national holidays. Lessons falling on these days will not be made up.

No student is permitted to take part in any public performance without consent of the director.

Students of this department will be granted certificates, if desired, testifying to quality and amount of work done.

Recitals are given from time to time by the instructors and advanced students to which admission is free.

Music to a total of not more than six credits may be counted toward a degree in those courses which allow free electives. To those regular students who elect music the college will furnish free one thirty-minute lesson a week during the junior and senior years, or any quarter of either year; and the work may be elected in either vocal or instrumental music.

PIANO.

The instruction in piano will comply with the special needs of each individual student, and the courses of music given them to study, will be taken from the works of such standard composers as are recognized by the leading musicians and musical institutions of the world. Specimen programs illustrating the class of music taught will be sent to anyone interested by the department. Elementary harmony is given with the piano lessons as an aid to the analysis of each piece, which is so necessary in memorizing.

Ensemble and Sight Reading.

In this branch of instruction lie indispensable elements of musical knowledge and culture. Ensemble playing develops the students' ability in reading at sight, and enables them to acquire an acquaintance with the masterworks of symphonic and orchestral literature, which is ordinarily inaccessible to the music student.

Theory.

Courses in harmony and musical history will be given if the demand justifies.

VOICE.

The training and development of the voice proceeds hand in hand with the acquisition of musical taste and intelligence. Methods are adapted to individual needs. The voice is trained for correct placement, artistic tone, flexibility and agility. The possibilities of varied tone qualities for expressional purposes are emphasized and illustrated. The study of vocal technique includes the subjects of breathing, resonance, tone color, correct attack, sustained tones, scales, arpeggios, legato, staccato, embellishments. Various exercises are used. Attention is given to elegance of diction.

The cultivation of musical taste and artistic interpretation is effected by study of the best modern and classic art songs, operatic arias, and oratorio selections. The art of singing is a complex one as so much depends on the intellectual and emotional status of the

singer. Hence the singer should aim to acquire general culture, appreciation of the beautiful in the world of thought and emotion as well as in the realm of sound.

VIOLIN.

The aim of the department is the acquisition of thorough technique and the study of the works of the best masters. Ensemble playing forms an important part of the course.

MUSIC TUITION.

Piano With Mr. Nash.

One half hour lesson per week for one quarter	$15.00
Two half hour lessons per week for one quarter	27.00
Ensemble playing per quarter	7.00

Piano With Miss Hartman.

One half hour lesson per week for one quarter	$12.00
Two half hour lessons per week for one quarter	23.00

Voice With Mr. Currier.

One half hour lesson per week for one quarter	$15.00
Two half hour lessons per week for one quarter	27.00

Violin With Mr. Jackson.

One forty-five minute lesson per week for one quarter	$18.00
Two half hour lessons per week for one quarter	24.00
One hour ensemble lesson per week for one quarter	18.00

When students enter late, lessons missed will be deducted at the rate of $1.00 per lesson.

Piano practice on the college pianos may be arranged for at the following rates:

One hour daily per quarter	$3.00
Additional hour per quarter	2.50

PHYSICAL EDUCATION.

DIRECTOR, UNA B. HERRICK (Dean). INSTRUCTOR, LORA MAXWELL. MEDICAL EXAMINER, DR. H. H. JUDD.

The aim of the physical education department for women is to develop each woman to her highest economic value as a unit of society, to the end that when she finishes her college course she may carry

forth into life a sane, well balanced, logical mind, high moral character, and a strong symmetrical properly functioning body, capable of assuming and performing cheerfully and well the duties of cultured womanhood.

Students who are relieved for any reason of the requirements in physical training, shall present four additional credits in some other subject; but the president may, at his discretion, excuse from such requirements any student in the employ of the institution.

Indoor and outdoor tennis courts and a volley ball court are furnished for the women, and beginning classes are organized; competitive games, including indoor baseball, are played between classes throughout the year.

Lectures are given on personal hygiene; general deportment for women; dress from the standpoint of health and appearance; the physiology of bodily exercise. The regulation gymnasium suit and shoes, which may be obtained from a local dealer, will be required.

1. **Physical Education.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Miss Maxwell.

Physical examination on entering. The chief aim throughout the year is to establish good posture and carriage and strengthen vital functions. The work will consist of Swedish body building work, some floor tactics, German rhythmic dancing and games. Lect. 2.

2. **Physical Education.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Miss Maxwell.

The work will consist of lectures and recreational games. Lect. 2.

3. **Playground.** 3 Q. Autumn, winter and spring. Continuous. 6 cr.

This course will include thorough preparation in theory, methods and practice teaching in physical education. Games, playground work, corrective exercises and folk dancing.

4. **First Aid.** 2 Q. Winter and spring. 4 cr. Miss Maxwell.

First aid and hygiene. Designed to give students useful and practical knowledge of what they should do when accidents and illness occur, in their own environment.

PHYSICS.

Professor, F. W. Ham. Instructor, J. A. Kiefer.

The following courses in physics are designed to meet the needs of (1) those students who are preparing to take up some of the more technical studies in engineering or agriculture, (2) those who expect to become physics or science teachers, and (3) those general science students who wish to acquire some scientific training which is peculiar to the science of physics alone.

1. Engineering Physics. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Ham.

More mathematical and technical than Physics 1a and particularly designed to meet the needs of students in engineering. Students who have not completed the calculus, mathematics 4, are required to take it during the same year that Physics 1 is taken. Lect. 3.

1a. Agricultural Physics. 1 Q. Spring. 6 cr. Prerequisite Mathematics 2 or 2a. Fee $1; Deposit $1. Mr. Ham.

A general course with special emphasis on the fundamental principles of physics important in the different branches of agriculture. Lect. 3; lab. 3.

2. Physical Measurements. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Fee $1; Deposit $1. Mr. Kiefer.

Laboratory course designed to supplement Physics 1. Lab. 2.

3. Light and Sound. 1 Q. Spring. 3 cr. Prerequisites Physics 1, 2. Mr. Kiefer.

Theory of light in its application to familiar optical phenomena and to optical instruments. The phenomena and laws of sound. Lect. 3.

4. Physical Measurements. 1 Q. Spring. 2 cr. Fee $1; Deposit $1. Mr. Kiefer.

Laboratory course in light and sound to supplement Physics 3. Lab. 2.

5. Electricity and Magnetism. 2 Q. Autumn and winter. 6 cr. Prerequisites Physics 1, 2, Mathematics 4. Fee $1; Deposit $1. Mr. Ham.

Methods for the exact measurements of resistance, electromotive force, current, capacity, and the coefficient of self-induction. Calibration of commercial instruments, insulation testing, and magnetic measurements. Lect. 2; lab. 1. Lect. 1; lab. 2.

6d. Pedagogy of Physics. 1 Q. Spring. 4 cr. Prerequisites Physics 1, 2, 3, 4. Mr. Ham.

Methods of teaching, the selection and performance of effective lecture table and laboratory experiments and practice on presenting the topics covering such experiments to elementary and college classes. Lect. 4.

9. Household Physics. 1 Q. Winter. 4 cr. Fee $1; Deposit $1. Mr. Ham.

A general course including the physics of ventilation, the lighting and heating of houses and other physical phenomena of interest to the housekeeper. Lect. 2; lab. 2.

10. Meteorology. 1 Q. Spring. 4 cr.

Sources and measurement of atmospheric temperature, pressure

and circulation of the atmosphere, measurement and movement of moisture, cause and prevention of frost. Part of the course will consist of a study of Montana weather bulletins. Lect. 4.

11. **Electron Theory.** 1 Q. Spring. 3 cr. Prerequisites Mathematics 4, 10 credits of college physics. Mr. Ham.

Graduate course open to undergraduates who can satisfy the prerequisites. Not a survey course but a discussion of recent research work. Lect. 3.

Secondary Schools

The secondary schools offer the following courses:

1. School of Agriculture; 2. School of Home Economics; 3. School of Mechanic Arts. These courses continue through a period of three years of six months each.

School of Agriculture

The School of Agriculture offers practical instruction to the young men from the farms of Montana who wish to fit themselves for successful farming. The courses offered are intended as a preparation for life rather than for college. The student is brought into actual contact with the problems connected with the farm and learns that agriculture is a profession requiring both skill and knowledge.

Students in this school have the privilege of studying a modern dairy in operation, including types of the best breeds of dairy cattle; a complete poultry plant in operation, containing breeds illustrating especially the best laying strains and market fowls; modern grain and soil laboratories; model farm buildings and barns, with pure bred livestock; the experiment station farm; greenhouses and orchards; and the large biological, chemical and physical laboratories, and well-equipped wood and iron shops of the engineering department.

The variety of animals included upon the farm affords ample opportunity to see the various diseases, injuries, etc., encountered in farm animals. In the veterinary building, there is provided a clinic room, where sick and injured animals are treated, and the student is given the benefits of these demonstrations.

The course extends through three years of six months each and comes in the winter season when the young men can be spared from farm work. For admission to this school, students must have passed the eighth grade or its equivalent, or give satisfactory evidence to the principal of the school that they are capable of carrying on the work. Young men twenty-one years of age or over will be admitted to the course without having completed the eighth grade provided they have had some practical experience on the farm and possess a fair common school education. Those who satisfactorily complete the course will be given certificates.

COURSE IN THE SCHOOL OF AGRICULTURE

FIRST YEAR

	Autumn	Winter
English Exercises (Eng. a)	4	4
Elementary Physics (Phys. b)	5	
Animal Types (An. Husb. b)		2
Animal Types (An. Husb. a)	2	
Mechanical Drawing (M. A. k)	2	2
Parliamentary Law (Eng. d)		2
Carpentry (M. A. a)	2	2
Elective	4	7
Military Science (Mil. Sci. a)	1	1

SECOND YEAR.

English Composition (Eng. b)	2	2
Plant Propagation and Tree Planting (Hort. a)	4	
Elementary Chemistry (Chem. a)		5
Field Crops (Agron. b)		4
Field Crops (Agron. a)	4	
Breed Types (An. Husb. d)		2
Farm Dairying (Dairy a)	3	
Forge (M. A. b)		2
Breed Types (An. Husb. c)	2	
Common Diseases (Vet. Sci. a)		4
Soils (Agron. c)	4	
Dairy Management (Dairy b)		3
Elective	3	
Military Science (Mil. Sci. b)	1	1

THIRD YEAR.

Composition and Literature (Eng. c)	2	2
Farm Management and Accounts (Agron. d)	4	
Plant Diseases (Bot. a)		3
Feeding and Management (An. Husb. e)	3	
Feeding and Management (An. Husb. f)		3
Animal Breeding (An. Husb. d)	3	
Rural Sociology (Soc. b)		3
Agricultural Economics (Econ. a)	3	
Farm Motors (M. A. s)		3
Forge (M. A. b)	2	
Insect Pests (Ento. a)		3
Elective	5	5
Military Science (Mil. Sci. c)	1	1

Note—Electives and options must be selected subject to the approval of the principal of the secondary schools.

Electives: First year, Autumn Quarter: Mathematics (a), (f); History (d).

Electives: First year, Winter Quarter: Mathematics (a), (e); Horticulture (b); Art (b); History (a); Agronomy (e). Those who take Mathematics (a), or History (a), the first quarter of the first year will continue with the chosen subject the Winter Quarter.

School of Home Economics

The School of Home Economics is designed especially to fit young women to become home builders. The well equipped laboratories, kitchens, sewing rooms, dairy, greenhouses, etc., are admirably fitted for making instruction intensely practical.

The entrance requirement for the three-years course is the completion of the eighth grade in the common schools or the equivalent. The young women who do not continue their studies have a practical training which fits them for home making, and which furnishes an excellent preliminary training for the vocations based upon domestic science and art.

The course extends through three years of six months each. Those who satisfactorily complete the course will be given certificates.

COURSE IN THE SCHOOL OF HOME ECONOMICS.

FIRST YEAR	Autumn	Winter
English Exercises (Eng. a)	4	4
Textiles (H. E. c)	2	
Garment Making (H. E. a)	2	4
Drawing (Art a)	2	2
Parliamentary Law (Eng. d)		2
Cooking (H. E. g)	4	4
Industrial Arithmetic (Math. f)	4	
Home Gardening (Hort. d)		3
Physical Education (Phys. Ed. a)	1	1
SECOND YEAR.		
English Composition (Eng. b)	2	2
Cooking (H. E. e)	4	4
Dressmaking (H. E. b)	3	4
Household Sanitation (H. E. k)	3	
General History (Hist. a)	4	4
Chemistry (Chem. a)		5
Elective	4	
Physical Education (Phys. Ed. b)	1	1
THIRD YEAR.		
Composition and Literature (Eng. c)	2	2
House Planning and Decoration (H. E. m)	3	
Home Dairying (Dairy c)		3
Home Nursing (H. E. f)	2	
Household Management (H. E. j)		4
Foods (H. E. h)	2	2
Dressmaking (H. E. d)	2	2
Elective	8	6
Physical Education (Phys. Ed. c)	1	1

Note—Electives and options must be selected subject to the approval of the principal of the secondary schools.

School of Mechanic Arts

The course in Mechanic Arts is designed principally for those who wish to do their own mechanical work on the farm, to prepare themselves to become shop foremen, electricians, section bosses, engine men, firemen, contractors, traction engine men, draftsmen, etc.

For admission to this course the equivalent of an eighth grade certificate is required.

The large, well equipped science laboratories, drawing rooms, and shops provide facilities for work that will rank with the best secondary polytechnic schools. The instruction is given by the regular faculty members in these subjects. Those who satisfactorily complete the course will be given certificates.

COURSE IN THE SCHOOL OF MECHANIC ARTS.

FIRST YEAR	Autumn	Winter
English Exercises (Eng. a)	4	4
Algebra (Math. a)	4	4
Mechanical Drawing (M. A. m)	2	2
Forge (M. A. b) or		
Carpentry (M. A. a)	2	2
Elective	6	6
Military Science (Mil. Sci. a)	1	1

SECOND YEAR.		
English Composition (Eng. b)	2	2
Shop Arithmetic (Math. e)	4	4
Elementary Physics (Phys. c)	4	4
Mechanical Drawing (M. A. n)	2	2
Elective	7	7
Military Science (Mil. Sci. b)	1	1

THIRD YEAR.		
Composition and Literature (Eng. c)	2	2
Geometry (Math. c)	4	4
Elective	13	13
Military Science (Mil. Sci. c)	1	1

Note—Electives and options must be selected subject to the approval of the principal of the secondary schools.

Electives: Mechanic Arts: (a), (a1), (b), (b1), (d), (d1), (e), (g), (h), (h1), (j), (m), (n), (q), (t), (u), (v), (w), (y).

COURSES OF INSTRUCTION.

AGRONOMY.

PROFESSOR, A. ATKINSON. ASSISTANT PROFESSORS, W. O. WHITCOMB, E. L. CURRIER, H. E. MURDOCK.

a. Field Crops. 1 Q. Autumn. 4 cr. Mr. Whitcomb.

Methods of growing and producing oats, wheat, flax, rye, and corn. Lect. 3; lab. 1.

b. Field Crops. 1 Q. Winter. 4 cr. Prerequisite Agronomy a. Mr. Whitcomb.

Forage crops and grasses. Lect. 3; lab. 1.

c. Soils. 1 Q. Autumn. 4 cr. Fee $1. Mr. Whitcomb.

Formation and classification of soils, including a study of tillage and the methods for keeping up the soil's productiveness. Lect. 3; lab. 1.

d. Farm Management and Accounts. 1 Q. Winter. 4 cr. Mr. Currier.

Practical methods of managing a farm. Lect. 3; lab. 1.

e. Farm Machinery. 1 Q. Winter. 3 cr. Prerequisite Physics b. Mr. Murdock.

Study the various types of farm machinery. Selection, adjustment and care of farm machinery. Modern farm conveniences, such as telephones, water supply systems, etc. Lect. 2; lab. 1.

f. Irrigation and Drainage. 1 Q. Autumn. 2 cr. Prerequisite Physics b. Mr. Murdock.

Methods of irrigating and draining land. Lect. 1; lab. 1.

ANIMAL HUSBANDRY.

PROFESSOR, C. N. ARNETT. ASSISTANT PROFESSORS, R. C. MCCHORD, E. H. RILEY. INSTRUCTOR, O. TRETSVEN.

a. Animal Types. 1 Q. Autumn. 2 cr. Fee $1. Mr. Tretsven.

Market types of cattle and sheep. Lab. 2.

b. Animal Types. 1 Q. Winter. 2 cr. Fee $1. Mr. Tretsven.

Judging of market types of dairy cattle, horses and swine. Lab. 2.

c. Breed Types. 1 Q. Autumn. 2 cr. Fee $1. Prerequisites Animal Industry a, b. Mr. Riley.

Breed types of cattle and sheep. Lect. 1; lab. 1.

d. Breed Types. 1 Q. Winter. 2 cr. Prerequisites Animal Husbandry a, b. Mr. Riley.

Breed types of dairy cattle, horses, and swine. Lab. 1.

e. Feeding and Management of Livestock. 1 Q. Autumn. 3 cr. Prerequisites Animal Husbandry c, d. Fee $2. Mr. Tretsven.

Methods of feeding and managing cattle and sheep. Methods by which animals are prepared for the show ring. Lect. 2; lab. 1.

f. Feeding and Management of Livestock. 1 Q. Winter. 3 cr. Prerequisites Animal Husbandry c, d. Fee $2. Mr. Tretsven.

Methods of feeding, showing and managing horses and hogs. Lect. 2; lab. 1.

g. Animal Breeding. 1 Q. Autumn. 3 cr. Prerequisites Animal Husbandry c, d. Mr. McChord, Mr. Riley.

Principles of breeding as directly applied to the farm. Cross breeding, inbreeding, and line breeding. Lect. 2; lab. 1.

ART.

ASSISTANT PROFESSOR, LANA BALDWIN. INSTRUCTOR, MURIEL MOORE.

a. Drawing. 2 Q. Autumn and winter. 4 cr. Fee $.50. Miss Moore.

Freehand drawing from geometric solids and casts. Study of light and shade. Object drawing, in charcoal, pencil pen and ink. Study of linear perspective with practical exercises in perspective sketching. Lab. 2.

b. Drawing. 2 Q. Autumn and winter. 4 cr. Fee $.50. Miss Moore.

Continuation of course a, with study of design and handicraft. Lab. 2.

BOTANY AND BACTERIOLOGY.

PROFESSOR, D. B. SWINGLE. ASSISTANT PROFESSOR, H. M. JENNISON.

a. Plant Diseases. 1 Q. Winter. 3 cr. Fee $1. Mr. Jennison.

A study of the importance, symptoms, and methods of control of the more important diseases of plants. Lect. 2; lab. 1.

CHEMISTRY.

PROFESSOR, W. M. COBLEIGH. INSTRUCTOR, E. C. HYTREE.

a. Elementary Chemistry. 1 Q. Winter. 5 cr. Fee $4; Deposit $4. Mr. Hytree.

Lectures with experimental illustrations, and recitations on general elementary chemistry. Special emphasis will be given to the applications of the science to daily life and to agriculture. Lect. 3; lab. 2.

DAIRY HUSBANDRY.

PROFESSOR, G. L. MARTIN.

a. Farm Dairying. 1 Q. Autumn. 3 cr. Fee $2; Deposit $.50.

Dairy problems as applied to building up the dairy herd, care and management of the herd, and marketing dairy products. Applications

of the Babcock test, and operation of hand separators. Lect. 2; lab. 1.

b. Dairy Management. 1 Q. Winter. 3 cr. Fee $1; Deposit $.50.

Factors influencing the secretion, composition and properties of milk, care, and handling of milk and cream; hand separators, cooling vats, grading, sampling and testing milk and cream, making butter and cheese on the farm and marketing dairy products. Lect. 2; lab. 1.

c. Home Dairying. 1 Q. Winter. 3 cr. Fee $1; Deposit $.50.

Composition, properties and uses of milk and its products, care and handling, fermentations, adulterations, modifications, ripening of cream for butter making. Manipulation of tests, manufacture of butter, cheese, and frozen products. Lect. 2; lab. 1.

d. Dairy Manufactures. 1 Q. Winter. 3 cr. Fee $1; Deposit $.50.

Factory methods of making butter, cheese, and frozen products; scoring and preparing them for market. Factory management and dairy accounts. Lect. 2; lab. 1.

Dairy (d) is elective for short course students during second quarter.

e. Advanced Judging of Dairy Cattle. 1 Q. Autumn. 2 cr.

The advanced judging of dairy cattle will include practice work and trips to dairy farms. Lect. 1; lab. 1.

Dairy (e) is elective for short course students during the first quarter.

ECONOMICS AND SOCIOLOGY.

PROFESSOR, J. M. HAMILTON (President).

a. Agricultural Economics. 1 Q. Autumn. 3 cr.

A study of such agricultural economic problems as the value and rent of land, farm labor, rural credit, cooperative buying and selling. Lect. 3.

b. Rural Sociology. 1 Q. Winter. 3 cr.

The social problems of the open country, rural health and sanitation, the country church, the rural school, the means of communication and transportation, libraries and recreations. Lect. 3.

ENGLISH.

PROFESSOR, J. H. HOLST. INSTRUCTOR, JESSIE DONALDSON.

a. English Exercises. 2 Q. Autumn and winter. 8 cr. Mr. Holst, Miss Donaldson.

Practice in spelling, punctuation, note taking, letter writing, and the simpler forms of compositions. Lect. 4.

b. English Composition. 2 Q. Autumn and winter. 4 cr. Mr. Holst.

The paragraph and its development; the news item and short news

story; business forms; practice in oral and written composition.

c. Composition and Literature. 2 Q. Autumn and winter. 4 cr. Mr. Holst.

Oral and written exercises in narration, description, exposition and argumentation; current literature, use of the library.

d. Parliamentary Law. 1 Q. Winter. 2 cr. Mr. Holst.

The principles of parliamentary law, the conduct of meetings, the organization of a society, the duties of officers, the recording of proceedings. The students will be given drill and actual practice. Lect. 2.

ENTOMOLOGY AND ZOOLOGY.

PROFESSOR, R. A. COOLEY.

a. Insect Pests. 1 Q. Winter. 3 cr. Mr. Cooley.

Consideration of the more important insect pests of Montana and the means of their control. Lect. 3.

HISTORY.

ASSISTANT PROFESSOR, HELEN R. BREWER.

a. General History. 2 Q. Autumn and winter. 8 cr.

A course in modern history. Lect. 4.

HOME ECONOMICS.

PROFESSOR, LILLA HARKINS. ASSISTANT PROFESSORS, FLORENCE BALLINGER, CARLOTTA FORD. INSTRUCTORS LISA OSTERHOLM, IDA TRUMAN.

a. Garment Making. 2 Q. Autumn and winter. 6 cr. Fee $1. Miss Osterholm.

Fundamental principles of hand and machine sewing applied to the making of aprons and undergarments. Students provide suitable materials. The finished work is the property of the student. Lab. 2 or 4.

b. Dressmaking. 2 Q. Autumn and winter. 7 cr. Fee $1. Miss Ballinger.

Designing, cutting and making simple dresses.

c. Textiles. 1 Q. Autumn. 2 cr. Fee $1.50.

Study of cotton, wool, silk, and linen, in regard to its microscopical structure, physical properties, manner of growth, and manufacture into cloth. Simple tests for adulteration. Lect. 1; lab. 1.

d. Dressmaking. 2 Q. Autumn and winter. 4 cr. Fee $.50. Miss Ballinger.

e. Cooking. 2 Q. Autumn and winter. 4 cr. Fee $2. Miss Ford. Lect. 1; lab. 2.

f. Home Nursing. 1 Q. Autumn. 2 cr. Miss Ford.

Care of sick room, making beds, bathing, bandaging, emergencies, etc. Lect. 1; lab. 1.

g. Cooking. 2 Q. Autumn and winter. 8 cr. Fee $3. Miss Ford.

Plain cooking, such as breads, meats, eggs, cereals, soups, salads, preserving fruits, cakes, candy and simple dessert. Visits to the meat market to study cuts of meat. Students are shown how biology and chemistry apply to the preparation of foods. Lect. 2; lab. 2.

h. Foods. 2 Q. Autumn and winter. 4 cr. Fee $2.50. Miss Ford.

General principles of human nutrition. Some attention is given to invalid cookery. Lab. 2.

j. Household Management. 1 Q. Winter. 4 cr. Fee $.50. Miss Osterholm.

Expenditure of income, furnishing with reference to enonomy and efficiency, also the working out of a number of home problems by each member of the class. Lect. 3; lab. 1.

k. Household Sanitation. 1 Q. Autumn. 3 cr. Miss Osterholm.

Care of the home from a sanitary standpoint. Source of water supply, and preservation of food. Lect. 2; lab. 1.

m. House Planning and Decoration. 1 Q. Autumn. 2 cr. Miss Osterholm. Lect. 1; lab. 2.

HORTICULTURE.

PROFESSOR, O. B. WHIPPLE. ASSISTANT PROFESSOR, C. C. STARRING.

a. Plant Propagation and Tree Planting. 1 Q. Autumn. 4 cr. Fee $1. Mr. Starring.

Plant propagation with special reference to the methods of multiplying fruit and planting of trees. The latter part of the course deals with simple principles of ornamental planting and ornamental plants, and the growing of trees adapted to Montana conditions. Lect. 4.

b. Vegetable Gardening and Small Fruit Culture. 1 Q. Winter. 3 cr. Mr. Starring.

Methods of growing, gathering, storing, and marketing the more important vegetable crops; hot bed construction and management; and the growing of such small fruits as the strawberry, raspberry, blackberry, currants, and gooseberry. Lect. 3.

c. Fruit Growing. 1 Q. Autumn. 3 cr. Prerequisite Horticulture a. Mr. Starring.

Selecting sites, planning and planting, cultivation, irrigation, pruning, and general care of the orchard, more especially from the standpoint of the home orchard. Lect. 3.

d. Home Gardening. 1 Q. Winter. 3 cr. Mr. Starring.

Elementary course dealing with the principles of plant propagation, vegetable gardening, small fruit culture, and ornamental gardening. Lect. 3.

MATHEMATICS.

PROFESSORS, W. D. TALLMAN, J. H. HOLST. INSTRUCTOR, ANNIE BRENEMAN.

a. **Algebra.** 2 Q. Autumn and winter. 8 cr. Miss Breneman. Lect. 4.

b. **Advanced Algebra.** 1 Q. Autumn. 4 cr. Miss Breneman.

Simultaneous quadratic equations, graphical representations of simple equations in two variables; theory of indices, (positive, negative, fractional, zero.) radicals, etc. Lect. 4.

c. **Plane Geometry.** 2 Q. Autumn and winter. 8 cr. Prerequisite Mathematics a. Miss Breneman.

This includes in addition to the work given in the standard texts, a large number of original exercises. Lect. 4.

d. **Solid Geometry.** 1 Q. Winter. 4 cr. Prerequisites Mathematics b, c. Miss Breneman.

This course covers ordinary work in solid geometry with special attention to geometry of the sphere. Lect. 4.

e. **Shop Arithmetic.** 2 Q. Autumn and winter. 8 cr. Miss Breneman.

Designed to develop skill and accuracy in the fundamental processes of arithmetic. Problems will be chosen very largely of the type the student will actually encounter in connection with his mechanical work. Lect. 4.

f. **Industrial Arithmetic.** 1 Q. Autumn. 4 cr. Mr. Holst.

Fundamental processes of arithmetic related to home and farm experience. Mathematical problems connected with the work of the shop and laboratory. Lect. 4.

MECHANIC ARTS.

PROFESSOR, A. W. RICHTER (Dean). ASSISTANT PROFESSORS, R. T. CHALLENDER, F. C. SNOW. INSTRUCTORS, F. W. KATELY, F. C. MILLER, F. HOMANN. MR. J. C. PARK.

a. **Carpentry.** 2 Q. Autumn and winter. 4 cr. Fee $2; Deposit $1. Mr. Challender.

Use and care of carpentry tools. Series of exercises in joinery, followed by practice in framing and rafter and stair cutting. Lab. 2.

a1. **Carpentry.** 2 Q. Autumn and winter. 2 to 12 cr. Deposit $4. Mr. Challender.

Continuation of course (a) for those who wish to continue the work in carpentry. Lab. 1 to 6.

b. **Forge.** 2 Q. Autumn and winter. 4 cr. Fee $2; Deposit $2. Mr. Kately.

Care and manipulation of fire, iron, forging, including the operation of drawing, upsetting, pointing, bending, welding, calculation of

stock; implement repairs, plow pointing, manufacture of chains, hooks, clevises, etc. Lab. 2.

b1. Forge. 2 Q. Autumn and winter. 2 to 12 cr. Deposit $4. Mr. Kately.

Continuation of course (b) for those who wish to continue the work in forge. Lab. 1 to 6.

d. Foundry. 1 Q. Autumn. 2 cr. Fee $1. Mr. Kately.

Bench and floor molding in green sand. Casting in white metal, brass, and cast iron are poured for use in the machine shop. Lab. 2.

d1. Foundry. 2 Q. Autumn and winter. 2 to 12 cr. Deposit $4. Mr. Kately.

Continuation of course (d) for those who wish to continue the work in foundry. Lab. 1 to 6.

e. Pattern Making. 2 Q. Autumn and winter. 4 cr. Fee $1. Mr. Challender.

Allowances on pattern for draft, shrinkage and finish, construction of patterns for pulleys, hangers, machine parts and pipe fittings, and the necessary core boxes. Lab. 2.

f. Machine Work. 2 Q. Autumn and winter. 6 cr. Fee $1; Deposit $1. Mr. Homann.

Bench work, including chipping, filing, scraping, fitting machine tool work on drill press, shaper, planer, and lathe. Lab. 2 or 4.

g. Machine Work. 2 Q. Autumn and winter. 4 cr. Fee $1; Deposit $1. Mr. Homann.

Chipping and filing. Bench work in iron. Lab. 2.

h. Machine Work. 2 Q. Autumn and winter. 4 cr. Fee $1; Deposit $1. Mr. Homann.

Work on lathe, milling machine and grinder, with practice in hardening and tempering taps, dies, cutters and high speed steels. Lab. 2.

h1. Machine Work. 2 Q. Autumn and winter. 2 to 12 cr. Deposit $4. Mr. Homann.

General shop work, continuation of course (h) for those who wish to continue the work in machine shop. Lab. 1 to 6.

j. Automobile Repair and Operation. 1 Q. Winter. 2 cr. Fee $1; Deposit $1. Mr. Homann.

Construction and repair of the automobile. Lect. 1; lab. 1.

k. Mechanical Drawing. 2 Q. Autumn and winter. 4 cr. Mr. Miller.

Elements of lettering; geometrical construction, isometric and orthographic representations, working drawings. Farm building construction, bills of material. Farm maps. Lab. 2.

m. Mechanical Drawing. 2 Q. Autumn and winter. 4 cr. Mr. Miller.

Lettering. Geometrical Construction, freehand sketching of simple

machine parts, reproduced in detailed working drawings; orthographic projection. Lab. 2.

n. Mechanical Drawing. 2 Q. Autumn and winter. 4 cr. Mr. Miller.

Machine and architectural detail drawing, tracing and blue printing; isometric and cabinet projection; intersections and development of surfaces with applications in roof framing and sheet metal work. Lab. 2.

q. Steam Boilers and Practice. 2 Q. Autumn and winter. 10 cr. Fee $1. Mr. Richter, Mr. Challender, Mr. Park.

Three hours recitation and two periods practice per week. Lect. 3; lab. 2.

r. Steam and Gasoline Engines. 1 Q. Winter. 4 cr. Prerequisite Mechanic Arts a. Fee $1; Deposit $1. Mr. Homann.

Construction and operation of steam and gasoline engines and tractors, valves and valve gears, governors; lubricators; indicator cards, indicated horsepower, brake horse power, efficiency. Lect. 2; lab. 2.

s. Farm Motors. 1 Q. Winter. 3 cr. Fee $1; Deposit $1. Mr. Park.

Motors adapted to use on the farm, particularly the gas engine, with practice in operating and locating troubles. Tractor practice and study of simple stationary installations. Lect. 1; lab. 2.

t. Electrical Practice. 2 Q. Autumn and winter. 6 cr. Prerequisite Physics c. Fee $1. Mr. Sloan.

Elementary principles of electricity, electric wiring, management and care of electrical machines and apparatus, including dynamos and motors, batteries, electric lights, telephones and telegraph apparatus. Lect. 2; lab. 1.

u. Gas Engines and Gas Tractors. 2 Q. Autumn and winter. 4 cr. Fee $1; Deposit $1. Mr. Homann.

Operation, construction and repair of gasoline engines and gas tractors. Lect. 1; lab. 1.

v. Leveling. 2 Q. Autumn and winter. 4 cr. Mr. Snow.

Determination of slopes and distances. Measurement of plane areas. Lect. 1; lab. 1.

w. Pipe Fitting and Plumbing. 1 Q. Autumn or winter. 2 cr. Fee $1; Deposit $1. Mr. Park.

Fitting of steam and gas pipe, exercises in plumbing, wiping joints. Lab. 2.

y. Water Measurement. 1 Q. Autumn or winter. 2 cr. Mr. Snow.

Measurement of water by means of weirs and current meters. Hydraulic rams. Small water power installations. Lect. 1; lab. 1.

MILITARY SCIENCE.

PROFESSOR, CAPTAIN H. C. CLARK. INSTRUCTOR, ...

a. Military Science. 2 Q. Autumn and winter. 2 cr.

Refer to military science courses in the college for a description of this work and the courses that follow.

b. Military Science. 2 Q. Autumn and winter. 2 cr.

c. Military Science. 2 Q. Autumn and winter. 2 cr.

PHYSICAL EDUCATION.

MRS. UNA B. HERRICK (Dean). INSTRUCTOR, LORA MAXWELL.

a. Physical Education. 2 Q. Autumn and winter. 2 cr.

Physical examination on entering. The chief aim throughout the year is to establish good posture and carriage and strengthen vital functions. The work will consist of Swedish body building work, some floor tactics, German rhythmic dancing and games, Class exercises 2.

b. Physical Education. 2 Q. Autumn and winter. 2 cr.

Athletics. Tennis, volley ball, basketball, indoor baseball, and recreational games, lectures and exercises.

c. Physical Education. 2 Q. Autumn and winter. 2 cr.

Folk dancing. Recreational games. Class exercises 2.

PHYSICS.

PROFESSOR, F. W. HAM, INSTRUCTOR, J. A. KIEFER.

a. Elementary Physics. 3 Q. Autumn, winter and spring. Continuous. 12 cr. Fee $1; Deposit $1. Mr. Kiefer.

Lectures with experimental illustrations, recitations, assigned problems, and laboratory work in mechanics, sound heat, light, electricity and magnetism. Lect. 3; lab. 1.

b. Elementary Physics. 1 Q. Autumn. 5 cr. Mr. Kiefer.

Experimental lectures, recitations, and assigned problems on mechanics, heat, light and electricity. Emphasis will be placed upon those subjects that have a direct bearing on applied agriculture. Lect. 5.

c. Elementary Physics. 2 Q. Autumn and winter. 8 cr. Mr. Kiefer.

Demonstration lectures, assigned problems, and recitations in mechanics, heat, electricity and magnetism, light and sound. Lect. 3; lab. 1.

POULTRY HUSBANDRY.

PROFESSOR, W. F. SCHOPPE.

a. Farm Poultry. 1 Q. Autumn. 3 cr.

Various breeds and their adaptability to farm use. Housing, feeding, incubator and brooding. Judging birds, operating incubators and brooders. Lect. 1; lab. 2.

VETERINARY SCIENCE.

PROFESSOR, H. WELCH.

a. Common Diseases of Animals. 2 Q. Autumn and winter. 8 cr.

Diagnosis and treatment of the common ailments of domestic animals. First aid treatment for wounds and injuries, methods of diseases prevention and farm sanitation. Care of breeding animals, and a brief course of instruction in the handling of normal, abnormal parturition. The course is illustrated by clinic cases as far as possible.

b. Infectious Diseases of Animals. 1 Q. Winter. 2 cr. Prerequisite Veterinary Science a.

This course deals with the more important contagious diseases of farm animals. Prevention vaccination, quarantine regulations, eradication of infection, etc. Laws regulating interstate shipments.

Summer Session

The courses of the Summer Session are designed primarily to meet the needs of the rural teachers of Montana who are interested in making the school serve the community in a very definite way, and also to prepare teachers, supervisors, principals and superintendents who will work under the new Vocational Education law. Courses will be given in agricultural and industrial subjects, but what is of at least equal value, constructive planning for rural betterment through the agency of the school, will be emphasized.

We must look to the rural school for the general diffusion of agricultural knowledge. It is the duty of the Agricultural College not only to prepare teachers to meet examination requirements in agriculture, but also to give them the broader outlook which will enable them to apply that knowledge to the improvement of country life conditions through a due consideration of economic and social relations.

JOINT SUMMER SESSION

Miss Ida Davis, County Superintendent of Schools of Gallatin County, has designated the Agricultural College Summer Session as her County Summer School and extends an invitation to other County Superintendents to hold a joint summer school with her. The college will furnish the faculty and equipment and will refund railroad fare under the terms stated elsewhere in the bulletin. Eleven counties joined in this session last year and there is reason to hope for an increased number this year.

VOCATIONAL EDUCATION

Montana has accepted the provisions of the Smith-Hughes law which provides for the training of teachers of vocations, and the department of Vocational Education is now a regularly organized department of the college. This department will offer strong courses which ought to appeal to teachers, supervisors, principals and superintendents who wish to fit themselves for efficient participation in this vital movement in education.

LOCATION

The Gallatin Valley is noted for its ideal summer climate. It is never too warm to study. The beautiful campus and unexcelled surroundings are an inspiration to good work.

The campus and college farm include four hundred acres. The experiment station grounds with numerous fields and plots devoted to demonstration and research work hold much of interest to the rural teacher. The state grain laboratory, state pure food laboratory, the soils laboratory, the college dairy, the greenhouses, and the poultry plant are a few of the interesting establishments found on the campus.

The Northern Pacific and Milwaukee railroads make Bozeman easily accessible from all parts of the state.

WAR WORK

The Summer Session does not call men and women from war service. The Agricultural college is dedicated to the government in winning the war. Those who are effectively engagd in agricultural production or in any other essential industry should "carry on;" others who find here an opportunity for preparation for greater service are invited to come.

During the Summer Session a course of lectures dealing directly with the history and progress of the war will be given; other courses will relate to the production, preparation and conservation of foods and other war time essentials. Teachers will get patriotic inspiration which should find expression in their school work.

War work business courses in typewriting, office practice and accounting will be offered to meet the demand in offices affected by the draft and volunteer enlistments.

COURSES OFFERED.

AGRICULTURE

- Agriculture for Teachers
- Vocational Agriculture
- Boys' and Girls' Club Projects and the curriculum
- Soils
- Crops

ARTS AND CRAFTS

- Publis School Drawing
- Handicrafts

BIOLOGY

- Botany for Teachers

CIVICS

- The Federal Government
- The State Government
- Montana School Law

EDUCATION

- Elementary Psychology
- Vocational Psychology
- Problems in Vocational Education
- Principles of Teaching
- Secondary School Problems
- Rural School Management
- Primary Methods
- History of Education

GEOGRAPHY

HORTICULTURE

- Home and School Gardening
- Principles of Plant Culture.

HOME ECONOMICS

- Foods and Cooking.
- Advanced Course in Foods and Cooking
- Garment Making for the Home
- Advanced Course in Garment making.
- Methods of Teaching

HISTORY

- U. S. History and Methods
- History of Montana

HYGIENE AND SANITATION

LANGUAGE AND LITERATURE

- Grammar and Composition
- American Literature

MATHEMATICS

- Algebra
- Plane Geometry
- Arithmetic in the Rural School

MANUAL TRAINING

- Elementary Manual Training
- Advanced Manual Training

PHYSICS

PLAYGROUND, GAMES, AND STORY TELLING.

PUBLIC SCHOOL MUSIC

READING

WAR WORK BUSINESS COURSES

- Typewriting.
- Office Practice
- Principles of Accounting

GENERAL INFORMATION.

Professional Preparation Required.

"After July first, 1920, no person shall be given a regular certificate to teach, who has not had at least twelve weeks of normal training work." This requirement can be met by attendance at two summer sessions.

Agriculture Must Be Taught in the Public School.

The law now requires that agriculture be taught in the public schools of the state and the State Board of Education has added that subject to the list of subjects required for a second grade certificate. The Agricultural College Summer Session will have the faculty and equipment to meet the requirements of the new law in the preparation of teachers.

Admission.

The courses are open to all persons who are qualified to pursue them to advantage.

Certificates and Credits.

Certificates of attendance and for courses satisfactorily completed will be issued to all who attend. Courses corresponding to those required for a teacher's certificate will, if satisfactorily completed, be entitled to certificate credit, when approved by the Director of the Summer Session and the State Superintendent of Public Instruction.

The Round Table.

The round table discussions which have been an interesting feature of the Agricultural College Summer Sessions will be continued. At least three hours each week will be provided for the round table. Rural problems of general interest will be considered under the direction of capable leaders selected from the faculty and students.

The Conference Hour.

The faculty of the summer session will be men and women in intimate touch with rural problems. Several members are prominent leaders in rural school work, and they will appoint one hour each day for individual conferences. Experience has shown that many teachers welcome such an opportunity for direct personal assistance in matters which may not be of general interest or which they may feel some timidity in bringing to the round table.

General Assembly.

A general assembly will be held for twenty minutes each morning. This time will be given to announcements and to singing under the direction of the leader in community singing. A general assembly will also be held at 11 o'clock on Friday of each week at which time visiting lecturers will be heard.

Teachers' Appointment Committee.

The summer session will maintain an appointment committee to assist teachers in securing positions. The services of the committee are free to students and school officers. Last year more than 50 vacancies were reported to the director.

Library.

The college library will be open throughout the summer session and an extensive classified list of bulletins, conveniently arranged, will be available for reading and reference. The attention of the rural teacher will be called to the vast amount of valuable information in bulletin form for free distribution, and directions and plans for its use will be given.

Recreation.

Students will have the use of the college tennis courts and gymnasium. Outdoor games in which all are invited to take part will be encouraged and competent direction will be provided.

Week-end excursions will be made to beautiful Bridger Canyon and the United States fish hatchery, to a highly developed rural community with its school and church, and industrial and social organization, to other places of interest.

The mountains, canyons and trout streams near Bozeman invite to wholesome recreation during the recesses from work.

Excursion Through the Yellowstone Park.

At the close of the session the fifth annual excursion through the Yellowstone National Park will be made. From thirty to fifty teachers take advantage of this excursion every year, and it is accounted one of the most pleasant and profitable features of the session. Eight days spent in the Wonderland of America. The conveyances and accommodations are first class and the total expense low.

Further information about the trip through the park will be furnished on application to the Director of the Summer Session.

EXPENSES.

Registration.

A registration fee of $10.00 is required of all regular students. Any single course may be taken for a fee of $5.00 and the laboratory fee, if there be any in connection with the course taken. Those taking a single course will not be entitled to any refund of railroad fare.

Board and Room at Hamilton Hall.

Board and room for women at Hamilton hall will cost $40 for the session or $6.75 per week, in advance in both cases. Men may be accommodated for board only at $30 for the session or $5.00 per week. Board and room in private families will cost about $25 to $30 per month. Hamilton Hall will be ready for occupancy on the afternoon of June 16. An advance deposit of $5.00 to apply on board should be sent in advance for a reservation.

Board at Summer Session Club.

Good board may be had at the Summer Session club about six blocks from the campus. The Club will be run on the cooperative plan as it is during the regular sessions. Board will cost about $27 for the session of six weeks. A reservation fee of $5.00 should be sent in advance, as the number that can be accommodated is limited to 40. Rooms may be secured near the club for $10.00 to $15.00 per month. Two may occupy a room and reduce expenses.

Refund of Railway Fare.

The University desires to make the opportunities for study afforded in the Summer Sessions equally accessible to all Montana teachers and students.

Therefore, each regularly enrolled student who carries satisfactorily at least four hours of regular work for at least four weeks during the summer session will be entitled to receive, at the close of the session, a refund of the amount paid for the round trip railway fare less $5.00 The amount of the refund will be based upon the cheapest route at the one and one-third round trip rate. The refund will not include the war tax. The railroad tax must be paid by the student. This refund cannot be made to teachers or students coming from points outside the state, or to anyone who has not secured the proper railway receipts.

Railway Rates in Montana.

By agreement, the Northern Pacific, the Chicago, Milwaukee and St. Paul, the Great Northern, the Oregon Short Line, the Burlington, and the Butte, Anaconda and Pacific, one and one-third round trip rates will be allowed in Montana on the certificate plan. Tickets will be on sale June 12 to July 27 inclusive, and are good for return travel up to and including August 6; no certificate to be honored unless such has been in attendance at the Summer Session for a period of at least ten days.

To take advantage of this rate every student must get a receipt when purchasing a ticket. The receipt must not include the tax imposed by the Act of Congress of October 3, 1917. If a student travels over two or more railway lines in reaching Bozeman, receipts should be procured from each road. Do not buy a round trip ticket.

Fees.

Fees to cover breakage and material furnished to students will be required as follows:

Cooking	$3.00
Sewing	$1.00
Public School Drawing	1.00
Handicrafts	3.00
Manual Training	1.50
Primary Methods	1.00
Chemistry	1.50

COURSES OF INSTRUCTION.

Courses marked (*) may be taken for college credit.

AGRICULTURE.

Professor, M. J. Abbey. Assistant Professor, W. O. Whitcomb.

S1. Agriculture for Teachers. 2 cr. M. T. W. Th. F. at 9. Mr. Abbey.

A course in the fundamentals of agriculture and methods of teaching it. Phases of the subject will be emphasized which apply to Montana conditions. Class room discussions, lectures, laboratory exercises and the preparation of lesson plans.

S2. Boys' and Girls' Club Projects. 2 cr. M. T. W. Th. at 11. Mr. Abbey.

A study of those phases of agriculture and home economics which are included in home project work. Purpose of project work, organization, supervision and its relation to the school curriculum.

***S3. Vocational Agriculture.** 2 cr. M. T. W. Th. F. at 2. Mr. Abbey.

The study of agriculture from the vocational standpoint. Outlines of courses of study, equipment, methods of presentation and correlation with community activities. Intended primarily for high school teachers of agriculture.

***S4. Crops.** 2 cr. M. T. W. Th. F. at 10. Mr. Whitcomb.

A study of reproduction and germination in cereals, grasses and legumes; history, cultural methods and uses.

***S5. Soils.** 2 cr. M. T. W. Th. F. at 1. Mr. Whitcomb.

The origin, formation and classification of soils and a study of modern tillage methods and the conditions affecting the soil's productiveness.

ARTS AND CRAFTS.

INSTRUCTOR, VERNA T. YOUNG.

S1. Public School Drawing. 2 cr. M. T. W. Th. F. at 9 and 11. Including pencil and crayon, water color, design in theory and practice, lettering, and paper cutting.

S2. Handicrafts. 2 cr. M. T. W. Th. F. at 2. Mrs. Young.

Basketry, weaving, braiding, knot tying, hitches, rope splicing.

BOTANY.

S1. Elementary Botany and Montana Flora. 2 cr. M. T. W. Th. F. at 10.

Elementary general botany. Sources of information and plans for independent study. Some special work on Rocky Mountain flora for those who are prepared to pursue the study.

CHEMISTRY.

PROFESSOR, W. M. COBLEIGH.

S1. Chemistry of Rural Life. 2 cr. M. T. W. Th. F. at 9. Mr Cobleigh.

Elementary principles of chemistry and their practical applications to rural life problems such as the soil, fertilizers, alkali, plants and their uses, insecticides, fungicides, dairy products, the manufacture, preservation, and adulteration of foods, farm sanitation including the water supply, sewage disposal and ventilation. Class exercises illustrated with museum exhibits and practical lecture demonstration that teachers can use in rural schools.

CIVICS.

S1. State and Federal Government. 2 cr. M. T. W. Th. F. at 2.

A review and study of state and federal government. The correlation of history and civics. Plans and methods adapted to the new course of study for the rural schools of Montana.

S2. Montana School Law. 2 cr. M. T. W. Th. F. at 11. Miss Davis.

The whole subject of school law with special attention to the duties of the teacher as an officer of the state; school boards, care of property, contracts, records and reports.

EDUCATION

Professors, J. M. Hamilton (President), M. J. Abbey, J. H. Holst. Assistant Professor A. Livingston.

S1. Elementary Psychology. 2 cr. M. T. W. Th. F. at 2. Mr. Hamilton.

The principles of psychology presented so as to make them of practical use in the school room, materials and methods of modern psychology. This course will prepare for the teacher's examination.

S2. Rural School Organization and Management. 2 cr. M. T. W. Th. F. at 9.

A course in theory and practice. The program, records, alternations. The relation of the home and school through the application of the course of study. The relation of the home and school through extra mural activities. Home study and occupations.

S6. Educational Psychology. 2 cr. M. T. W. Th. F. Mr. Livingston.

Considered from the standpoint of the studies of the curriculum. This will also include some genetic and experimental psychology.

S7. Theory and Practice of Teaching. 2 cr. M. T. W. Th. F. Mr. Livingston.

This will include a study of the aims of education, the fundamentals of teaching, the recitation, class management, and the use of scales.

S10. Problems of Vocational Education. 2 cr. M. T. W. Th. F. Mr. Livingston.

A brief consideration of the purpose of industrial education and of types of industrial schools; principles governing selection of industrial teaching material; problems of discipline; keeping up with changing conditions in industry.

S11. Secondary School Problems. 2 cr. M. T. W. Th. F. Mr. Livingston.

The fundamental conception of the secondary school and its differentiation from other types of institutions; its functions; the grounds upon which vocational studies in secondary schools are to be justified;

the organization; equipment, and administration of the school; the principles underlying the curriculum.

S12. Primary Methods. 2 cr. M. T. W. Th. F. at 1.

An outline of the work to be presented, the sequence and relation of subjects. The materials and methods adapted to the rural school. A study of approved methods in presenting reading, nature study, language, numbers and penmanship in the first three grades.

ENTOMOLOGY.

PROFESSOR, R. A. COOLEY.

S1. Elementary Beekeeping. 2 cr.

Practical elementary consideration of beekeeping based on a standard text. Structure and habits of bees; equipment; control of swarming; producing comb and extracted honey; care of bees in the winter; One afternoon per week of practical work with bees.

GEOGRAPHY.

S1. Geography. 2 cr. M. T. W. Th. at 11; F at 3.

A review of subject matter and the development of plans of presentation. The preparation and use of materials. The geographical library and its use.

HISTORY.

PROFESSOR, J. M. HAMILTON (President).

S1. The Political History of the United States. 2 cr. M. T. W. Th. F. at 1.

The modern history of the United States and the outstanding facts of the contemporary history. The development of present institutions from those of the past. Some lines of review in the light of present development. The use of the course of study.

S2. Montana History. 1 cr. M. T. W. Th. F. at 1 (first 3 weeks). Mr. Hamilton.

A study of such important events as the Lewis and Clark Expedition, the fur-traders, the early missionaries, Steven's explorations, the pioneers and gold discoveries, Indian campaigns, railroads, the cattle country, etc. The library has an abundance of reference material and the lectures will be illustrated with lantern slides.

HOME ECONOMICS.

S1. Foods and Cooking. 2 cr. M. T. W. Th. F. at 10 and 12.

Lectures and laboratories. Adapted to rural schools. Kinds of foods as to composition and use in the body. The cost and prepara-

tion of food. Relation of hygiene and sanitation. Study of cereals, meat, milk, eggs, bread, and vegetables. The hot lunch in rural schools.

S2. Advanced Cooking. 2 cr. M. T. W. Th. F. at 2 to 4.

Application of the science underlying the selection and preparation of foods. The dishes prepared illustrate the scientific principles involved.

S3. Garment Making. 2 cr. M. T. W. Th. F. at 1 to 3.

Illustration of various stitches, the drafting and making of a number of garments; the study of materials, textiles and fibres. The application of the work to the needs of the rural school is kept constantly in mind.

S4. Advanced Sewing and Textiles. 2 cr. M. T. W. Th. F. at 1 to 3.

The taking of measurements, drafting patterns, use of commercial patterns, cutting, fitting and finishing as applied to simple dress. A brief study of textiles.

HORTICULTURE.

PROFESSOR, O. B. WHIPPLE.

S1. School and Home Gardening. 2 cr. M. T. W. Th. F. at 10. Mr. Whipple.

The school garden, its aims and objects with practical demonstrations in planning, planting and caring for one. Decoration of school grounds. Principles of vegetable gardening with practice work in starting plants and transplanting and caring for such crops.

***S2. Principles of Plant Culture.** 2 cr. M. T. W. Th. F. Mr. Whipple.

A study of plant culture presented for the purpose of acquainting the student with the fundamental principles of plant growth and plant propagation. The material presented will be of particular value to those preparing themselves to teach elementary agriculture in the grades.

HYGIENE AND SANITATION.

S1. Hygiene and Sanitation. 1 cr. M. W. F. at 8.

The character and location of the farm house, barns and wells. Drainage; the water supply; sources and modes of infection. Sanitary conveniences, ventilation, personal hygiene. The State Course of Study in Hygiene.

LANGUAGE AND LITERATURE.

INSTRUCTOR, MADGE STARK.

S1. Grammar and Composition. 2 cr. M. T. W. Th. F. at 8.

S2. American Literature. 2 cr. M. T. W. Th. at 11; F. at 3.

S3. Reading. 2 cr. M. T. W. Th. F. at 9.

MATHEMATICS.

PROFESSOR, W. D. TALLMAN.

S1. Rural Arithmetic. 2 cr. M. T. W. Th. F. at 10.

A consideration of the adaptability of the various rural arithmetics. The methods and subject matter necessary to relate the teaching of arithmetic to other subjects and to the farm and home. The solution of various classes of problems.

S2. Elementary Algebra. 2 cr. M. T. W. Th. F. at 8.

This course will depend somewhat on the demands and capacity of the students. It is based on the "First Course in Algebra" by Hawkes-Luby-Touton, and is expected to cover at least the work to quadratic equations.

S3. Plane Geometry. 2 cr. M. T. W. Th. F. at 9.

The theorems and constructions including the general properties of plane rectilinear figures, the circle, measurements of angles, similar polygons, arcs, the regular polygons, the solution of original exercises, including loci problems and the application to mensuration of lines and plane surfaces.

S4. Trigonometry. 2 cr. M. T. W. Th. F. at 10.

The development of the general formulae and their application to the solution of triangles, polygons, and original field problems, Kenyon-Ingold will be used as a text.

MECHANIC ARTS.

ASSISTANT PROFESSOR, R. T. CHALLENDER.

S1. Manual Training. 2 cr. M. T. W. Th. F. 10 to 12.

The work this year will be devoted to practical drawing, lettering, the use and care of tools and a series of exercises in joining.

S2. Advanced Course in Manual Training. 2 cr. M. T. W. Th. F.

Consideration of the minimum equipment for the rural school, practical problems of direct interest; subjects and materials; specific plans, the making of model articles. A course for teachers who have had little or no experience with wood work in school.

PHYSICS.

PROFESSOR, F. W. HAM.

S1. Elementary Physics. 2 cr. M. T. W. Th. F. at 3.

Lectures and experimental demonstrations on the mechanics of solids, liquids and gases. A brief study of the simple elements of machinery.

S2. Mechanics. 2 cr. M. T. W. Th. F. at 9.

Special topics in mechanics, molecular physics and heat such as the co-efficients of elasticity, moments of inertial air, thermometry, hygrometry, capillarity, and calorimetry. Prerequisites: High school physics and trigonometry. A knowledge of calculus is also desirable.

S3. Physical Measurements. 2 cr. T. Th. F. at 1 to 3; M. W. at 10 to 12.

A laboratory course in college physics covering the same material as S2. Measurements of the constants dealt with in the discussions in S2 will here be made with considerable precision.

SPECIAL COURSES.

S1. Public School Music. 2 cr. M. T. W. Th. F. at 8. Mrs. Norton.

The first twenty minutes each morning will be devoted to singing by the assembled students, and the class in music will receive instruction during the remainder of the hour in sight singing, ear training, notation, child voice, rote songs and methods of teaching.

S2. Play, Games and Story Telling. 2 cr. M. T. W. Th. F. at 2 or 4. Miss Forrest.

Indoor and outdoor games by grades. Minimum equipment and recess programs for large and for small schools with children of all ages. Games for making the drills of daily school work more interesting. Folk dancing and calesthenic drills. Corrective work. Story telling and dramatization.

Text.—"Aid in Recreation" (Revised), Forrest. Note book required.

WAR WORK BUSINESS COURSES.

Instructor, J. R. Libby. Miss Rowe.

S1. Typewriting. Time and credit to be arranged. Miss Rowe

Use and care of typewriters. Exercises for development of proper wrist and finger movements and for the mastery of the keyboard. Practice in letter writing and the use of carbon.

S2. Office Practice. Time and credit to be arranged. Mr. Libby.

Scientific management applied to the office; office efficiency; planning the work; the work kept moving; records and files; the operation of various pieces of office equipment.

S3. Accounting. Time and credit to be arranged. Mr. Libby.

Accounting principles; accounts pertaining to various forms of business are kept; development of principal and auxiliary books; opening and closing books; adjustments for depreciation, accruals etc.

Roster

OF COMMANDANT, CADET OFFICERS AND CADET NON-COMMISSIONED OFFICERS.

COMMANDANT

Clark, Hollis C.....Professor of Military Science and Tactics

ASSISTANT

BATTALION STAFF

Pope, Alger W.....Captain and Adjutant, Acting Assistant
Reddick, Theopilus Attached

COMPANY A

Officers

Burke, John J., ...Captain
Taylor, Horace D.....First Lieutenant
Berg, Sigvald L.....Second Lieutenant

Non-Commissioned Officers.

McVey, Chester L.....First Sergeant
Kohnen, John H.....Sergeant
Oberle, Henry.....Sergeant
Walters, George W.,.....Sergeant
Dougherty, Thomas F.....Corporal
Wakefield, Arthur R.....Corporal

COMPANY B.

Officers

Stranahan, Clinton G. Captain
Muntzer, Henry First Lieutenant
Mabee, Will B., ...Second Lieutenant

Non-Commissioned Officers.

Stanley, Ernest First Sergeant
Price, Merwin J. Sergeant
Ecton, Zales N. Sergeant
Rowe, Forrest F. Sergeant
Schurch, Edward C. Corporal

CAMPANY C.

Non-Commissioned Officers.

Barrows, Eugene C. First Sergeant
Peterson, Ole Corporal
Bergman, Hugo Corporal
Blough, Henry L. Corporal

COMPANY D

Non-Commissioned Officers.

Neuman, Ernest First Sergeant
Moore, Roy Corporal
Jackson, Clarence Corporal
Hardtla, Clinton Corporal

Register of Students
1917-1918

GRADUATE STUDENTS

Dinsmore, O. R.	Civil Engineering	Minneapolis, Minn.
Lund, Janelle	Chemistry	Three Forks
Luther, Edith M.	Botany and Bacteriology	Choteau
Milnor, Estelle	Chemistry	Troy

GRADUATES NOT CANDIDATES FOR DEGREES

Alward, Mary L.	Secretarial	Bozeman
Bole, Margaret	Mechanical Engineering	Bozeman
Border Joseph E.	Vocational Education	Bozeman
Bush, Clarence A.	Vocational Education	Kalispell
Cambre, Robert G.	Vocational Education	Harlowton
Cannon, Raymond E.	Vocational Education	Glasgow
Cehrs, Carrie	Secretarial	Bozeman
Clark, Olive	Secretarial	Bozeman
Cubine, Georgia	Secretarial	Bozeman
Drewiecke, Leo A.	Vocational Education	Glendive
Ford, Carlotta M.	Secretarial	Bozeman
Gray, John Wright	Vocational Education	Belt
Hartman, June	Mechanical Engineering	Bozeman
Kauffman, Harry N.	Vocational Education	Kalispell
Morris, H. E.	Horticulture	Bozeman
Nutting, Grace B.	Botany and Bacteriology	Lititz, Pa.
Olson, Andrew J.	Vocational Education	Lewistown
Smith Henry Earl	Vocational Education	Three Forks
Swartz, Gustava V.	Home Economics	Ft. Benton
Taylor. Merlin M.	Agronomy	Philadelphia, Pa.

COLLEGE STUDENTS

SENIORS

Abrahamson, Irene	Home Economics	Red Lodge
Arneson, Harriet	Secretarial	Big Timber
Babbitt, Minnie E.	Home Economics	Victor
Border, Blanche	Home Economics	Bozeman
Borton, Albert J.	Agronomy	Glasgow
Brown, Mary Holland	Home Economics	Bozeman
Bunnell, Ercell	Mechanical Engineering	Bozeman
Burke, John J.	Electrical Engineering	Butte

Corkins, Clifford L.	Entomology and Zoology	Joliet
Danielson, Mary	Entomology and Zoology	Miles City
Drummond, Warren C.	Mechanical Engineering	East Helena
Emhoff, Elizabeth	Home Economics	Stevensville
Flood, Marie	Home Economics	Park City
Gray, Helen	Home Economics	Bozeman
Hagen, Roy C.	Electrical Engineering	Great Falls
Hall, Medra	Home Economics	Bozeman
Haller, Buelah Christina	Home Economics	Butte
Helstrom, Carl	Civil Engineering	Anaconda
Hodgskiss, Ruby Florence	Home Economics	Choteau
Hoem, Arthur	Mechanical Engineering	Butte
Johnson, Martha Irene	Home Economics	Clancy
King, Kenneth M.	Entomology and Zoology	Whitehall
Kneale, Morris T.	Civil Engineering	Bergen, N.Y.
Kountz, Josephine	Home Economics	Bozeman
Kuhns, Myrtle	Home Economics	Kalispell
Langohr, Margaret Louise	Home Economics	Bozeman
Lund, Helen	Applied Art	Three Forks
Merigold March	Applied Art	Kalispell
McCabe, John H.	Electrical Engineering	Kalispell
McCone, Alice Myrtle	Home Economics	Burns
Noble, Florence	Applied Art	Bozeman
O'Connor, Frank	Animal Husbandry	Red Lodge
Pippenger, Harold F.	Electrical Engineering	Glasgow
Pope, Alger	Mechanical Engineering	Bozeman
Quaw, Marjorie	Applied Art	Bozeman
Reddick, Theodore	Animal Husbandry	Hermosa, S. D.
Ritz, Gladys M.	Chemistry	Anaconda
Ross, Thomas A.	Animal Husbandry	Chinook
Rothwell, Howe	Civil Engineering	Columbus
Rowe, Mary A.	Secretarial	Victor
Sewell, J. Gordon	Industrial Chemistry	Anaconda
Sherry, C. B.	Agronomy	Camas
Stranahan Clinton G.	Animal Husbandry	Fort Benton
Streets, Rubert B.	Botany and Bacteriology	Helena
Swan, Ulmont	Mechanical Engineering	Butte
Werre, Harold W.	Animal Husbandry	Bozeman
Wilson, Harmon	Mechanical Engineering	Bozeman

JUNIORS

Axtell, Lucy	Applied Art	Bozeman
Baker, Ada D.	Secretarial	Plains
Beatty, Lura	Secretarial	Bozeman
Berg, Sigvald Ludwig	Architectural Engineering	Helena
Bergman, Clarence	Secretarial	Manhattan
Boberg, Washington	Animal Husbandry	Sandy, Utah

Bowlen, Wayne F.	Mechanical Engineering	Red Lodge
Bunnell, Marie	Home Economics	Bozeman
Chattin, Earl W.	Agronomy	Big Timber
Chattin, Lynnie	Home Economics	Big Timber
Davidson Paul Ballinger	Industrial Chemistry	Bozeman
Davis, Russell L.	Animal Husbandry	Lolo
Dickson, Harold	Animal Husbandry	Bozeman
Eames, Esther	Home Economics	Canyon Ferry
Erwin, James Kent	Electrical Engineering	Bozeman
Fitzgerald, James	Mechanical Engineering	Bozeman
Fowler, Leroy A.	Secretarial	Bozeman
Graves, Nelson F.	Animal Husbandry	Omaha, Neb.
Gray, W. David	Industrial Chemistry	Choteau
Haynes, Etta	Home Economics	Boulder
Humphrey, Leo	Chemistry	Holyoke, Mass.
Ingram, Doris	Home Economics	Helena
Jacoby, George	Architectural Engineering	Helena
Kearns, Katherine	Home Economics	Townsend
Knott Georgia Frances	Home Economics	Heron
Leckliter Gladys	Applied Art	Salesville
Linfield, Azalea	Home Economics	Bozeman
Mabee Will B.	Entomology and Zoology	Glasgow
Marchion, Elmo	Mechanical Engineering	Anaconda
Mashin, Ladimir	Animal Husbandry	Chicago, Ill.
Mills, Dorothy	Home Economics	Helena
Monforton, Lucille	Home Economics	Bozeman
Muntzer, Henry P.	Electrical Engineering	Butte
McCracken, Virginia Lucille	Secretarial	Livingston
McElwee, James	Electrical Engineering	Bozeman
McVey, Chester	Electrical Engineering	Stevensville
Noble, Daniel	Agronomy	Whitehall
Norcutt, Etta	Home Economics	Denton
Norris, Earl R.	Chemistry	Helena
Perring, Maude	Home Economics	Salesville
Prentiss Earl	Electrical Engineering	Hamilton
Reitz, Harold J.	Electrical Engineering	Terry
Roberts Otto	Animal Hsubandry	Salesville
Scott, Samuel G.	Industrial Chemistry	Butte
Seeley, Evelyn Georgiana	Secretarial	Bozeman
Senz, Melvin J.	Electrical Engineering	Terry
Smith, Robert B.	Entomology and Zoology	Bozeman
Solberg, Stella	Home Economics	Big Timber
Stanley, Ernest B.	Animal Husbandry	Whitehall
Stark, Albert P.	Industrial Chemistry	Livingston
Stewart, Harold	Mechanical Engineering	Bozeman
Stone, A. Parker	Animal Husbandry	Bozeman
Stone, Louise	Home Economics	Bozeman
Swan, Helen	Architectural Engineering	Butte

Taylor, Homer	Animal Husbandry	Clear Lake, Wash.
Taylor, Horace D.	Animal Husbandry	Bozeman
Walker, J. Paul	Agronomy	Bozeman
Waterman, Marie	Home Economics	Bozeman
Wheeler, Mark	Animal Husbandry	Gildford

SOPHOMORES

Alderson, Priscilla	Applied Art	Helena
Alexander, Bernal	Secretarial	Bozeman
Angell, Marcy	Secretarial	Kalispell
Beach, Ben	Animal Husbandry	Mitchell
Bishop, Mabelle Ernestine	Chemistry	Butte
Bush, Elmer J.	Animal Husbandry	Pony
Carroll, Charles P.	Electrical Engineering	Dillon
Carroll, Charles Washburn	Electrical Engineering	Hysham
Cocks, Leslie Vernon	Electrical Engineering	Great Falls
Cutting, H. Everett	Electrical Engineering	Bozeman
DeVries, Martin	Secretarial	Roberts
Dickman, Herman L.	Agronomy	Helena
Dougherty, Thomas F.	Agronomy	Plains
Ecton Zales N.	Secretarial	Bozeman
Finch, Fred A.	Animal Husbandry	Dillon
Flynn, Jesse Charles	Electrical Engineering	Logan
Gibbs, Benjamin F.	Electrical Engineering	Harlowton
Green, Doris Delilah	Secretarial	Glasgow
Green, Ruth M.	Botany and Bacteriology	Manhattan
Hall, Genevieve	Home Economics	Bozeman
Hannah, Georgia Belle	Secretarial	Fort Benton
Harris, Vera B.	Home Economics	Bozeman
Henry Forest G.	Electrical Engineering	Townsend
Herriott, Evelena A.	Home Economics	Thompson Falls
Holden, Zaydah A.	Home Economics	Lebam, Wash.
Hollier, Trina	Home Economics	Bozeman
Holst, John H.	Animal Husbandry	Bozeman
Hooper, Ethel Gladys	Secretarial	Lincoln
Kibble, Laura M. Rose	Secretarial	Roundup
Kohnen, John Holmes	Civil Engineering	Shelby
Kyle, Frances	Home Economics	Bozeman
Larse, Victor F.	Agronomy,	Plains
Lease, Helen Elizabeth	Home Economics	Great Falls
Linfield, Leila	Applied Art	Bozeman
Lippert, William C.	Animal Husbandry	Townsend
MacMillan, Gregor	Electrical Engineering	Butte
Marquis, Minnie Ellen	Home Economics	Bozeman
Mecklenberg, Walter L.	Animal Husbandry	Billings
Michel, Henry R.	Electrical Engineering	Bozeman
Millegan, Mary E.	Chemistry	Millegan

McConnell, Grant B.	Civil Engineering	Helena
McFarlin, Alfred E.	Mechanical Engineering	Dillon
Oberle, Henry	Electrical Engineering	Bozeman
Pickens, Russell M.	Agronomy	Huntley
Pitts Raymond	Mechanical Engineering	Bozeman
Pollard, Rolla E.	Industrial Chemistry	Craig
Pool. Vernie Viola	Home Economics	Townsend
Porter, Maud Augusta	Home Economics	Belgrade
Powell, Elmina Dorothy	Home Economics	Bozeman
Powell, Pauline	Home Economics	Bozeman
Prescott, Nota Carol	Secretarial	Belgrade
Price, Merwin J.	Agronomy	Ballantine
Roney, Clyde Elliss	Electrical Engineering	Missoula
Ropes, Dorothy E.	Home Economics	Helena
Rose, Helen	Entomology and Zoology	Bozeman
Rowe, Forrest F.	Animal Husbandry	Pasadena Cal.
Rowley, Hyacinth	Home Economics	Lewistown
Saldine, Emil J.	Civil Engineering	Great Falls
Schimd, Leroy P.	Electrical Engineering	Butte
Snyder, Bess Irene	Home Economics	Clarion, Pa.
Stearns, Frank L.	Chemical Engineering	Great Falls
Steele. Fred K.	Electrical Engineering	Great Falls
Sullivan, Ella	Home Economics	Townsend
Switzer, Florence	Entomology and Zoology	Bozeman
Templeton, A. Russell	Industrial Chemistry	Anaconda
Tobey, Willard H.	Animal Husbandry	Highwood
Tyler, John L.	Chemical Engineering	Hamilton
Wakefield, Arthur R.	Agronomy	Forsyth
Walsh, Margaret	Home Economics	Helena
Walters, George W.	Mechanical Engineering	Helena
Whitacre, Gladys Mary	Home Economics	Choteau
Wylie, John	Civil Engineering	Bozeman

FRESHMEN

Amer, William Ray	Mechanical Engineering	Anaconda
Axtell, Lillian	Home Economics	Bozeman
Bakèr, Alfred Leroy	Agriculture	Whitehall
Barnes, George Francis	Industrial Chemistry	Whitehall
Belknap, Jess Willard	Agriculture	Polson
Boifeuillet, George Donald	Electrical Engineering	Harlowton
Bowen, John William	Agriculture	Worden
Bowen, Lowell, Emery	Civil Engineering	Butte
Bradford, Loren Otis	Architectural Engineering.	Livingston
Brittan, Melville	Civil Engineering	Wilsall
Brotherton, Etole C.	Secretarial	Bozeman
Buchannan, L. L.	Vocational Education	Boulder
Burfening, Beryl	Secretarial	Bynum

Burgess, Marjorie May	Applied Art	Bozeman
Buzzell, Katherine Naomi	Applied Art	Conrad
Cameron Ray E.	Secretarial	Terry
Carey, Helen Margaret	Secretarial	Polson
Cherry Earl Leroy	Agriculture	Sidney
Conrad. Margaret Ashley	Applied Art	Kalispell
Copeland ,Audrey Lucile	Secretarial	Roundup
Cunningham, Myrna	Secretarial	Bozeman
Davis, Claudius Ira	Civil Engineering	Dillon
Dawes, Robert Earl	Electrical Engineering	Bozeman
Ditty, Winifred Ethel	Applied Art	Lewistown
Doe, Margaret Ethel	Secretarial	Philipsburg
Donohoe, Carroll Paul	Industrial Chemistry	Whitehall
Drummond, Lillian Helen	Secretarial	Terry
Dunbar, Wayne Lovelady	Secretarial	Polson
Durkee, Lindley Rathburn	Architectural Engineering	Polson
Duval, Mae	Secretarial	Anaconda
Eastman, Carl Victor	Secretarial	Anaconda
Ebersole Mary Ida	Home Economics	Glasgow
Edens, Charles	Electrical Engineering	Bozeman
Egan Mayme Ursula	Applied Art	Butte
Ellingson, Henry Joseph	Electrical Engineering	Big Timber
Evans. Mabel Lillian	Secretarial	Culbertson
Farnum, Charles Ernest	Agriculture	Harlem
Ferguson, Veda	Secretarial	Bozeman
Finlayson, Max T.	Chemistry	Livingston
Flint, Lyle Howard	Secretarial	Terry
Flanagan, Mary Catherine	Home Economics	Anaconda
Forbes, Ruth Louise	Secretarial	Helena
Forrest, Daisie Ella	Home Economics	Bozeman
Fosse, Dora Marie	Secretarial	Joliet
Foster, Henry Wright	Civil Engineering	Billings
Franks, Laura Gladys	Secretarial	Cardwell
Fransham, Edna L.	Secretarial	Bozeman
Fraser. Margaret Dorothy	Chemistry	Billings
Fritz, Vera Alberta	Secretarial	Mondovi, Wis.
Gerber, Elsie	Chemistry	Great Falls
Gilman. Vergle Day	Secretarial	Bozeman
Graves, Leonard Templeton	Secretarial	Polson
Griswold, J. Howard	Agriculture,	Brighton, Col.
Hall, Bernice	Secretarial	Bozeman
Haller, Charles Roy	Chemistry	Bozeman
Harding, Ruth Jane	Home Economics	Billings
Harner, Clara Beatrice	Home Economics	Belt
Harris, Charles Frank	Agriculture	Billings
Hart, Glen J.	Electrical Engineering	Harlowton
Heageney, Charles E.	Agriculture	Bozeman
Hepp. Floyd Edmond	Electrical Engineering	Polson

Hereim, Elida	Secretarial	Lennep
Heyn. Herbert Henry	Secretarial	Stevensville
Hibbert, Norman William	Agriculture	Chicago, Ill.
Higgins, Ida Maude	Nurses' Course	Bozeman
Higgins, Walter M.	Entomology and Zoology	Bozeman
Hill, Helen Maxine	Home Economics	Great Falls
Hirshland, Roy Pinkerton	Secretarial	Billings
Hodgskiss, Grant Henry	Electrical Engineering	Choteau
Holderby, Josephine May	Chemistry	Bozeman
Hollier, Myrtle	Secretarial	Bozeman
Hollingsworth, Harley William	Architect. Engineering,	Thornburg, Ia.
Holmes, Herschel K.	Chemistry	Bozeman
Hopkinson, Thomas G.	Electrical Engineering	Choteau
Hunt, Gerald Marshal	Secretarial	Bozeman
Icenoggle, Mary Redfield	Secretarial	Twin Bridges
Ireland, Ruth Alice	Secretarial	Winifred
Irwin, Clarence Henry	Architect Engineering,	Twin Bridges
Jacobson, Albert C.	Secretarial	Anaconda
James, Fred C.	Electrical Engineering	Wibaux
Jarvis Judson G.	Electrical Engineering	Bozeman
Johnson, Albert Jurgen	Electrical Engineering	Hinsdale
Johnson, Arthur Emanuel	Industrial Chemistry	Fromberg
Johnson, Edgar D.	Agriculture	Clancy
Johnson, Edith Morrison	Botany and Bacteriology,	Lewistown
Johnson, Ingwald Julius	Secretarial	Absarokee
Johnson, Millard Leroy	Electrical Engineering	Glasgow
Jones, Robert R.	Agriculture	Billings
Kangas, William Emanuel	Industrial Chemistry	Bozeman
Kelley, Earl J.	Electrical Engineering	Bozeman
Kelley, Gertrude G.	Nurses' Course	Bozeman
Kelley, Lloyd	Mechanical Engineering	Bozeman
Kennedy, Walter Allen	Electrical Engineering	Missoula
Kindler, Leone Marie	Secretarial	Columbus
Knowles, Richard	Chemical Engineering,	Columbia Falls
Kyle, Mary Abigail	Home Economics	Columbus
Laurandeau, Roy F.	Agriculture	Butte
Leavitt, Ernest Lester	Agriculture	Miles City
Lee, Esther Adelaide	Secretarial	Conrad
Lewis, Beulah Marie	Secretarial	Three Forks
Lewis, Donald John	Architectural Engineering	Hardin
Looney, Sterling M.	Electrical Engineering	Hardin
Lowman, Buford J.	Electrical Engineering	Como
Mabee, Helen Victoria	Secretarial	Glasgow
MacSpadden, Chester Hauck	Industrial Chemistry	Missoula
Mahan, Rubietta	Home Economics	Anaconda
Maloney, Daniel O'Connell	Civil Engineering	Missoula
Maloney, Harry Peter	Agriculture	Missoula
Maxwell Frank E.	Mechanical Engineering	Bozeman

Miller, Lyle Winston	Agriculture	Whitefish
Mcebus, Henrietta Kathryn	Home Economics	Butte
Moen, Leonard W.	Mechanical Engineering	Culbertson
McDonald, James Edmund	Agriculture	Whitehall
McDonel, Eva May	Secretarial	Philipsburg
McDonnell, Kathryn Aline	Secretarial	Bozeman
McDonough, William Neil	Agriculture	Fromberg
McFarlin, George Clark	Agriculture	Butte
McKee, Anna	Secretarial	Jeffers
McRoberts, Lewis	Industrial Chemistry	Bozeman
Nelson, Nels Edward	Agriculture	Dillon
Niebel Esther Christine	Secretarial	Bozeman
Niemi, Leonard S.	Mechanical Engineering	Red Lodge
Noble Ruth Elizabeth	Chemistry	Whitehall
Norton, Thomas M.	Chemistry	Big Timber
Ohlin, Enoch T.	Mechanical Engineering	Huntley
O'Handley, John Michael	Architectural Engineering	Belt
Omta, Anna	Secretarial	Belgrade
Pease, Douglas George	Mechanical Engineering	Bozeman
Pease, Muriel	Secretarial	Bozeman
Phillips, Veda Lillian	Secretarial	Moore
Pickney, Alvin Joseph	Industrial Chemistry	Bumer, Neb.
Pilger, Marie Henrietta	Secretarial	Butte
Pool, Gussie Elizabeth	Botany and Bacteriology	Townsend
Potter, Earl Francis	Industrial Chemistry	Bozeman
Ravet, Elizabeth Victoria	Home Economics	Bozeman
Reed, Dorothy Marion	Home Economics	Windham
Reed, Robert Dunlap	Agriculture	Windham
Robinson, Alberta Jane	Home Economics	Bozeman
Robinson, Martha Agnes	Secretarial	Bozeman
Ryno, Darrell Richard	Secretarial	Butte
Sayers, Leon David	Secretarial	Bozeman
Schneider, August M.	Mechanical Engineering	Helena
Schrecengost, Mary Catherine	Secretarial	Manhattan
Schreibeis, Edna	Secretarial	Sheridan, Wyo.
Schurch, Edward C.	Electrical Engineering	Billings
Shaules, Margaretha	Home Economics	Billings
Sheffield, Dale C.	Mechanical Engineering	Billings
Stanley, Mary Edith	Secretarial	Whitehall
Stumpf, Bruno	Electrical Engineering	Bozeman
Sutherland, Sidney Samson	Secretarial	Polson
Thompson Florence Mae	Secretarial	Wilton, N. D.
Thompson, Lawrence L.	Mechanical Engineering	Bozeman
Thompson, Stewart McKinley	Electrical Engineering	Great Falls
Trask, Phyllis	Secretarial	Ballantine
Tretsven, John Oscar	Agriculture	Bozeman
Tripp, Helen Louise	Home Economics	Butte
Tyler, Florence Gwendolyn	Secretarial	Hamilton

Walsh, Helen Bawden	Secretarial	Bozeman
Ware, Frank Edward	Electrical Engineering	Miles City
Waterman, Evelyn Pauline	Secretarial	Bozeman
Watts, Willard	Mechanical Engineering	Anaconda
Wesch, Florence Chrystine	Home Economics	Billings
Wiles, Glen Dewey	Chemical Engineering	Columbia Falls
Wilson Donald A.	Mechanical Engineering	Forsyth
Winzenburg, L. M.	Vocational Education	Deer Lodge
Wise. Willis Howard	Mechanical Engineering	Hardin
Woillard, Adele Marion	Home Economics	Butte
Wood, Marion	Secretarial	Bozeman
Wright, Robert G.	Agriculture	Lewistown

SECONDARY STUDENTS

FOURTH YEAR.

Angland, Maurice	Mechanic Arts	Great Falls
Curl, Mary	Home Economics	Gardiner
Griffith, Clement H.	Mechanic Arts	Dunedin. N. Z.
Hanscom, Eben	Mechanic Arts	Great Falls
Ritschel, Eva	Home Economics	Wisdom
Ritschel, Frances	Home Economics	Wisdom

THIRD YEAR

Calloway, James E.	Mechanic Arts	Great Falls
Gee, Hugo	Mechanic Arts	Belgrade
Glover Elizabeth W.	Home Economics	Fort Yellowstone
Hill, Grace	Home Economics	Yellowstone Park
Jackson, Clarence	Mechanic Arts	Bozeman
Lindsley, Marguerite	Home Economics	Yellowstone Park

SCHOOL OF AGRICULTURE

THIRD YEAR.

Bernstein, Maurice	Chicago, Ill.
Bissonett, Howard	Jens
Black, Irvin	Norris
Bokma, Peter	Conrad
Conant, Chris A.	Judith Gap
Gruar, John	Sixteen
Knowles, Radburn C.	Chico
Lathom, Earl	Columbus
Moore, Roy	Dutton
Paugh, John C.	Jeffers
Paugh, Robert	Jeffers

Peterson, Andrew Springdale
Shreve, Bennie Decker
Snyder, Wesley Glasston
Taylor, Raymond Cascade
Woodley, Francis Scobey

SECOND YEAR

Adams, Paul Froid
Anderson, Edwin Fox
Baker, F. Vinson Josephine
Ball, J. M. Edgar
Barrows, Eugene T. Fort Benton
Bawden, William E. Butte
Beach, Raymond Florence
Blough, Henry L. Winifred
Cheney, Clark Twin Bridges
Gard, Frank Chance, Wyoming
Goldberg, Clarence Jens
Graeber, James H. Winifred
Hardtla, Clinton Anaconda
Kemmis, George Sidney
Martinell, Paul R. Dell
Neuman, Ernest Heron
Peterson, Ole Geyser
Rorvik, Allen Circle
Stevens, Irving T. Harlowton
Tow, Wilfred Box Elder

FIRST YEAR

Arnold, Joseph A. Cobrug
Ballard, Robert R. Bozeman
Benson, John H. Ballantine
Berg, Amos Progress
Berg, Henry Progress
Brockley, Robert T. Comertown
Buttleman, John G. Willow Creek
Buttleman, William H. Willow Creek
Cameron, Walter R. Helena
Carlson, John T. Belfray
Christen, Paul E. Hayburn
Cornue, Harry E. Winnett
Creasey, Sim Dillon
Disney, Frank Roundup
Edwards, Harry G. Monarch
Eggen, Charles S. Absarokee
Erb, Seth Helena

Fadness, Knute Scobey
Gjullin, Robert W. Conrad
Gotzian, Conrad Thompson Falls
Groesbeck, Frederick Maudlow
Henderson, Roy J. Bozeman
Hubble, Lorris Stearns
Kurfiss, Harry L. Jeffers
Lee, Robert A. Decker
Martin, Dana Two Dot
Martin, Donald W. Bozeman
Moore, Don Dutton
McNiven, Johnnie Livingston
Nelson, Oran Sheridan, Wyoming
Nelson, Walter E. Heyburn
Nesheim, Bernard G. Roundup
Newton, Wesley Roundup
Olson, Carl S. Helena
Opheim, Norris P. Opheim
Parkhurst, Louis Browning
Paryzek, Adolphus Fort Benton
Peterson, Henry W. St. Paul
Peterson, William L. Cody
Reiquam, Marriam Adolf Collins
Reiquam, William R. Collins
Rouse, Harold G. Three Forks
Scott, Victor H. Fort Benton
Smail, William Ward Coffee Creek
Smith, Alfred K. Radersburg
Stephens, Alonzo G. Conrad
Stevenson, Sam M. Lodge Grass
Sweetser, Charley E. Forsyth
Swenson, Erling M. Helena
Walton, Lynn C. Springhill
Williams, Earl White Sulphur Springs
Wilson, George W. Billings

SCHOOL OF MECHANIC ARTS

THIRD YEAR.

Graeber, Esgar Winifred

SECOND YEAR

Dover, Charles Buffalo
Wilkins, Llew Kalispell

FIRST YEAR

Ballard, Richard T. Bozeman
Brost, Jonh M. Nashua
Brown, James A. Box Elder
Dayton, Carl W. Stevensville
Griffin, Wayne Inverness
Hatch, Charles A. Harlem
Hereim, Chirsten N. Lennep
Hockersmith, Howard J. Sun River
Hockersmith Maurice Sun River
Kent, Arthur L. Hardin
Linenweber, Orlando Alder
Mayer, Oscar H. Gilman
Mitchell, Raymond R. Norbert
Montgomery, Alvin Hardin
Oker, Donald Helena
Olson, Clarence H. Froid
Peterson, Carl J Conrad
Rosenberg, Oscar Bozeman
Sloan, Lewis W. Troy
Stark, Lewis B. Neihart
Stow, George M. Great Falls
Williams Orvil G. Bozeman

SCHOOL OF HOME ECONOMICS

THIRD YEAR

Brogelman, Henrietta Hardin
Coppock, Erma Buffalo
Payne Elsie Miles City
Redfield, Alta Twin Bridges

SECOND YEAR

Keirns, Gladys Victor
Tandy, Blanche R. Livingston
Wood, Rosalie Stevensville

FIRST YEAR

Ballah, Joy Kruger
Berg, Elsie Progress
Goldberg, Alice Jens
Hanson, Mabel A. Farmington
Kent, May Hardin
Otness, Olga B. Farmington
Parker, Marion J. Glasgow
Reese, Esther M. Belgrade
Stow, Alice M. Stearns

TRACTION AND STATIONARY ENGINE COURSE

Bergman, Hugo	Cascade
Bullard Richard	Fort Shaw
Carney, Hugh J.	Drummond
Collet, Leonard S.	Bozeman
Comer, Clayton,	Comertown
Doig, Donald	Sixteen
Eggler, Conrad A.	Ft. Shaw
Fletcher, Seth H.	Ft. Shaw
Friberg, Adolph	Inverness
Hendrickson, Earl	Florence
Hickey, Herbert L.	Victor
Jackson, Chester L.	Wilsall
Johnson, William R.	Bozeman
Jonhston, Joseph W.	Terry
Jordan, Clarence H.	Helena
Langley Archie	Potomac
Lindstrand, Clarence M.	Roundup
Milbrath, Luther	Loma
Miller, Lloyd	Belgrade
Miller, Louis O.	Belgrade
Morkrid, Olav	Lothair
McClarty, Percy	Somers
Nerlin, Andy N.	Joliet
Nitsche. Vernon N.	Absarokee
Peck, Leverett, J.	Sweet Grass
Piedalue, Eugene W.	Ronan
Resner, Harold R.	Ronan
Richardson, Clarence	Powderville
Rouse, William	Three Forks
Sheppard Herbert	Bozeman
Simmerman, Dewit F.	Sumatra
Spurgeon, Earl W.	Buffalo
Taylor, William	Belgrade
Winter, Alexander D.	Bozeman

MUSIC STUDENTS

Alderson, Priscilla	Voice, Violin	Bozeman
Anderson, Edwin	Violin	Bozeman
Armstrong, Mrs. V. T.	Voice	Bozeman
Axtell, Lucy P.	Piano	Bozeman
Babbitt, Minnie	Piano	Victor
Ballah, Joy	Piano	Kruger
Bartz, Florence	Violin	Bozeman
Bishop, Mabelle	Voice	Butte
Bishop, Madge	Voice	Bozeman

Blair, Dorothy	Violin	Bozeman
Brewer, Gertrude D.	Piano	Bozeman
Brewer Helen A.	Piano	Bozeman
Budd, Elva	Piano	Bozeman
Bunnell, Marie	Voice	Bozeman
Burket, Lester	Violin	Bozeman
Buzard, Marian	Piano	Bozeman
Chattin, Lynnie S.	Voice	Big Timber
Cherry, Earl	Voice	Sidney
Clark, Mary S.	Piano, Voice	Bozeman
Clarke, Bethel	Piano	Bozeman
Clopton, Myrtis	Piano	Bozeman
Cobleigh, Winifred	Piano	Bozeman
Coulson, William	Violin	Bozeman
Daniels, Mary	Voice	Bozeman
Doe, Margaret	Voice	Phillipsburg
Eames Esther	Voice	Canyon Ferry
Eberhart, Savallah	Violin	Bozeman
Ellingson Henry	Violin	Big Timber
Ennis, Eloise	Piano	Bozeman
Esgar, Rea	Piano	Bozeman
Faulbaum, Herman	Vioiln	Bozeman
Ferguson, Maude	Voice	Bozeman
Francis, Evelyn	Piano	Bozeman
Fransham, Edna	Voice, Piano, Ensemble	Bozeman
Gerber, Elsie	Piano	Great Falls
Gray, David	Violin	Choteau
Gray, Helen	Voice	Bozeman
Green, Doris	Piano	Glasgow
Griswold, J. Howard	Voice	Brighton, Col.
Grupp, Meta	Piano	Bozeman
Hall Medra	Piano	Bozeman
Haller, Beulah	Voice,	Butte
Hamill Norman	Violin	Bozeman
Hanks, Clementine	Voice	Bozeman
Haynes, Etta	Piano	Boulder
Higgins, Mae	Piano	Bozeman
Hodgskiss, Ruby	Piano	Choteau
Hollier, Myrtle	Piano, Ensemble	Bozeman
Hollier, Stella	Violin	Bozeman
Holm, Mrs. E. O.	Piano	Bozeman
Hutton, Donald	Violin	Bozeman
Hutton, Dorothy	Piano, Ensemble	Bozeman
Ingram, Doris	Piano	Helena
Johnson, Edna	Piano, Voice	Bozeman
Johnson, Martha	Piano	Clancy
Jones Marguerite	Voice	Conrad
Jones, Valens	Piano	Bozeman

Kelty, Edwin B.	Piano, Voice	Bozeman
Kibble, Laura	Voice	Roundup
King, Kenneth	Voice	Whitehall
Knott, Georgia	Voice	Heron
Kyle, Mary Abigail	Piano	Columbus
Langohr, M. Louise	Piano	Bozeman
Leckliter, Gladys	Voice	Salesville
Leckliter, Manila	Voice	Salesville
Linfield, Azalea	Voice	Bozeman
Linfield, Leila	Piano	Bozeman
Marigold, Florence	Piano	Kalispell
Marigold, March	Voice	Kalispell
Marley, Teresa	Voice	Bozeman
Marquis, Minnie Ellen	Voice	Bozeman
Millegan, Mary	Voice	Millegan
Monroe, Enid M.	Piano	Manhattan
Myers, Merle	Piano	Bozeman
McCracken, Virginia L.	Piano, Ensemble	Livingston
McFarland, Myrtle	Piano	Bozeman
Noble, Florence J.	Voice	Bozeman
Norcutt, Etta	Voice	Denton
Norris, Earl	Violin	Helena
O'Donnell, Kathleen	Violin	Bozeman
Owenhouse, Manuel	Violin	Bozeman
Park, John C.	Voice	Bozeman
Parker, Donald	Violin	Bozeman
Patten, Mary	Violin	Bozeman
Pease, Muriel	Piano	Bozeman
Piedalue, Aimee	Voice	Bozeman
Pippinger, Harold	Violin	Glasgow
Resner, Harold	Voice	Ronan
Ritschel, Frances	Voice	Wisdom
Ritz, Gladys	Voice	Anaconda
Robinson, Mrs. F.	Piano	Bozeman
Roy, Lena	Voice, Piano	Bozeman
Rutledge, Lenora	Violin	Bozeman
Sackett, Nona	Piano	Bozeman
Sales, Zada	Piano	Bozeman
Schuster, E. E.	Voice	Bozeman
Sears, Harry	Violin	Bozeman
Senz, Melvin J.	Piano	Terry
Sewell, Gordon	Voice	Anaconda
Shaules, Margaretha	Piano	Billings
Siefert, Albert	Violin	Bozeman
Smith Temple	Violin	Bozeman
Snyder, Bess I.	Piano	Clarion, Pa.
Stone, Louise	Piano	Bozeman
Story, Virginia S.	Piano	Bozeman

Stowe, Alice	Piano	Bozeman
Swan, Helen	Piano	Butte
Todd, Verle	Piano	Bozeman
Tripp, Helen	Voice. Piano	Butte
Tyler, Florence	Voice	Hamilton
Von Oven, A.	Voice	Bozeman
Walsh, Helen	Piano	Bozeman
Waterman, Marie	Voice	Bozeman
Westley, Frank	Violin	Bozeman
Willis, Verna	Piano	Bozeman
Young, Ethel	Piano	Bozeman
Zorn Idella	Piano	Bozeman

SUMMER SESSION

Adams, Orpha	Eudora
Allen, Mollie	Dillon
Alspaugh, Irene	Laurel
Anderson, Elsie	Bozeman
Anderson, Josephine	Tampico
Anderson, Pearl	Tampico
Armstrong, Katherine	Power
Armstrong, Stella	Power
Aumock, Bessie	Westmore
Bain, Lola M.	Joliet
Baker Altha	Virginia City
Baker, Ethel	Virginia City
Bartlett, Nellie	Columbia Falls
Berg, Mabel L.	Ekalaka
Bergen, Ludetta	Saco
Birkenbuel, Willie Gordon	Sun River
Blake, Gertrude J.	Billings
Bloes, Agnes	Columbia Falls
Bohart. Ruby E.	Bozeman
Bompart, Bessie M.	Helena
Bowen, Lulu	Park City
Braun, Mary J.	Hot Springs
Bray, Cora E.	Laurel
Broadbent, Estella	Hysham
Buhler, Marie	Polson
Burton Ellen Lavina	Billings
Buzard. Lenora	Bozeman
Campbell, Anna June	Hardin
Carlson, Jennie	Boulder
Chauner, Mae E.	Bozeman
Christensen, Hilda E.	Helena
Chute, Hattie	Columbus
Cleary, Katherine	Shelby

Costley, Delia C. Augusta
Cox, Marion N. Park City
Crary, Cora S. Sheridan
Cummings, Etta Troy
Darnall, Angie Bozeman
Dean, Mrs. R. M. Bozeman
DeCelles, Lucille Boulder
DeStaffany, Florence Kalispell
Dodds, Winifred Worden
Dolliver, Helen Helena
Dorrance, Ida Vaughn
Edmonston, Clara Shelby
Ellis, Vera M. Absarokee
Facey, Emma V. Crystal, North Dakota
Farrell, Edith B. St. Paul, Minnesota
Fink, Nora Nellie Baker
Finnegan, Catherine Pony
Fisher, C. Jane Kalispell
Fitzgerald, Anna Helena
Fletcher, Elsie B. Fort Shaw
Forrest Daisie Bozeman
Fuller, Ruth G. Worden
Garrett, Mabel Great Falls
Geiger, Mrs. Fidelia Melville
Gibson, Madge Belgrade
Gitchell, Alberta Ethbridge
Goddard, Grace Billings
Gray, Florence Bozeman
Gudmunsen, Lydia Columbus
Halcro, Edith E. Power
Hall, Viola Summers
Hanks, Clementine Bozeman
Haynes, Lois Great Falls
Hays, Gertrude Baggs, Wyoming
Henderson, Mrs. Gladys Belgrade
Henderson, Sadie Ollie
Hobbs, Margaret Joliet
Holyoak, Florence Cascade
Houx, Ruby F. Acton
Hull, Viola Bozeman
Ish, Erma Sun River
Jaquette, Dorothy Kalispell
Johnson, Grace M. Virginia City
Johnson, Marie Boyd
Kellams, Mrs. Pearl Medicine Lake
Kidder, Beatrice Kremlin
Kirk, Marguerite Bozeman
Kittinger, Dorothy Miles City

Kraemer, Louise Monarch
Kyriss, Lucy Broadview
Lawrence, Eva Bowen
Lee, Minnie Bozeman
Link, Edna Gardiner
Lowery, Anna E. Garnet
Luke, Mary E. Kalispell
Luke, Orpha Kalispell
Lundell, Agnes Sand Coulee
Lundell, Jennie Stockett
Lyle, Kathleen Helena
Madole, Edna Kalispell
Mainwaring, Gladys Laurel
Maryott, Vera Salesville
Mattson, Elsa Tampico
Matthews, Verle Bozeman
Mayland, Lillian Jeanette Great Falls
Mayland, Una C. Great Falls
Miller, Carrie Choteau
Milton, Mabel Kalispell
Moore, Sara Ashland
Morrow, Beulah Bozeman
Mostert, Wilhelmina Bozeman
McConnelee, Alice Greybull, Wyo.
McLauchlin, Flora Belfry
McMillan, Ina Miles City
McSweeney, Shirley Dunkirk
Nauman, Maude Miles City
Neely, Fay Bozeman
Nerlin, Vida Joliet
Nettlehorst, Ivy May Clyde Park
Nicholas, Ruby Laurel
Niles, Grace Livingston
Northy, Margaret Roberts
Nunamaker, Mrs. H. O. Gates
Oesterle, Dava Great Falls
Officer, Bessie Absarokee
O'Keane, Josephine Billings
O'Neill, Katherine Butte
Orth, Frances Bozeman
Owen, Estella Red Lodge
Owens, Florence Kalispell
Parker, Frances Creston
Passey, Ella Kalispell
Passey, Winifred Kalsipell
Peterson, Helma Webster
Peterson, Minnie Huntley
Peterson, Nettie Huntley

Peterson, Violet Worden
Ramsay, Mrs. C. G. Columbus
Randall, Cordelia Belgrade
Reich, Bertha Miles City
Reynolds, Hazel Rollins
Robison, Florence Billings
Rolfe, Mrs. E. F. Coalwood
Romine, Mrs. Tillie Bridger
Rose, Julia Dillon
Rosenberg, Mary Bozeman
Russell, Ruth Roberts
Rutledge, Jennie Vaughn
Ryan, Ellen Great Falls
Salo, Jennie Red Lodge
Sawyer, Evelyn Hardin
Schreiner, Zelda Townsend
Schultz, Emma Billings
Seeley, Florence Bozeman
Shaw, Georgia Fort Benton
Shepard, Clara Billings
Sloan, Mary Bozeman
Smith, Georgia Kalispell
Smith, Tina Butte
Stevens, Bessie Bozeman
Stockburger, Lois Lake Basin
Strain, Mae Ekalaka
Sundelius, Elizabeth Kila
Sunderland, Vera Helena
Sutton, Virginia Polson
Taylor, Katherine Ekalaka
Temeson, Arline Kalispell
Torrence, Alta Red Lodge
Tronson, Marion Great Falls
Vreeland, Dorothy Bozeman
Wagner, Ella Columbia Falls
Walker, Bertha Big Timber
Walter, Hazel Chance
Ward, Minnie Jeffers
Waterbury, Hope Helena
Webster, Annie Genon
Wheeler, Maud Gildford
Whitehead, Beulah Stockett
Wight, Silvia Joliet
Williams, Harriet Dunkirk
Wilson, Jean Creston
Winchell, Rose Ekalaka
Wood, Mrs. Claudia Cascade

MINISTERS' WEEK.

Barnes, L. C. New York
Burdick, Newman H. Helena
Chapman, A. L. Bozeman
Corell, Walter M. Dillon
Crego, Harrison P. Lewistown
Cress, G. Clifford Lewistown
Curtis, Chesley E. Bozeman
Donaldson, R. M. Boise, Idaho
Edwards, George Billings
France, J. B. Bozeman
Gatley, H. S. Missoula
Grant, Henry Laurel
Gwinn, A. S. Gildford
Harris, C. W. Bozeman
Haynes, P. W. Great Falls
Henry, Frank E. Plentywood
Hooker, S. D. Helena
Kinney, Bruce Topeka, Kan.
Mecklenburg, H. C. Three Forks
Mills, Wilson Omaha, Neb.
Morton, H. Q. Bozeman
McCausland, C. L. Butte
McConnell, R. A. Helena
North, Walter H. Billings
Noyce, Ralph B. Springdale
Parker, J. E. Missoula
Peet, Herbert M. Great Falls
Powell, G. J. Billings
Price, Oliver Bozeman
Puehler, Charles Billings
Reinoehl, Charles M. Helena
Shepard, G. W. Billings
Sloan, W. N. Helena
Smith, Edward Bozeman
Snowden, J. C. Bozeman
Spaulding, Walter B. Geraldine
Watrud, H. O. Cheyenne, Wyo.
Wilson, Lawrence A. Butte

FARMERS' WEEK AND FARM MARKET CONGRESS

Adams, W. H. Livingston
Ahern, T. E. Summit
Ahern, Mrs. T. E. Summit
Allsak, Ezra Bozeman
Anderson, A. D. Sidney
Anderson, Charles B. Bozeman
Anderson, E. W. Plentywood

Anderson, Mrs. John W. Hoffman
Atkinson, Mrs. Alfred Bozeman
Atkinson, J. C. Salesville
Bailey, Mrs. R. S. Bozeman
Barcus, Grover Hoyt Belgrade
Barnard, E. Marie Miles City
Barr, H. Bozeman
Bartholomew, Mrs. E. L. Bozeman
Baunly, Mrs. W. B. Bozeman
Beaucamp, Mrs. E. Bozeman
Bebb, A. W. Bozeman
Bebb, Lettie E. Bozeman
Beck, Mrs. Alonzo Bozeman
Becker, W. E. Bozeman
Beers, Howard W. Bozeman
Bennett, Robert L. Wilsall
Bennett, Mrs. R. L. Wilsall
Bennett, Robert L., Jr. Wilsall
Biering, J. R. Bozeman
Blair, Mrs. F. S. Bozeman
Bolinger, Mrs. H. A. Bozeman
Bonney, Mrs. Etta Twin Bridges
Border, J. E. Bozeman
Bowman, E. K. Helena
Briggs, Jesse Harrison
Brittan, Mrs. John Wilsall
Broich, Walter F. Forsyth
Brotherton, Pearl M. Bozeman
Buell, Mrs. H. S. Bozeman
Buell, Mrs. R. F. East Helena
Burlingame, W. M. Great Falls
Burke, Mrs. Edmund Bozeman
Burke, Mrs. W. E. Bozeman
Bush, Mrs. Clara Missoula
Bushnell, Howard C. Lombard
Buttleman, John Bozeman
Buttelman, Mrs. William Willow Creek
Cappedge, J. D. Bozeman
Carlson, Emily Farmington
Carlson, Mrs. John A. Farmington
Carpenter, Alvin R. Clyde Park
Carpenter, Mrs. A. R. Clyde Park
Carpenter, Chester Clyde Park
Castell, James Helena
Castell, Mrs. James Helena
Chapman, Andrew L. Bozeman
Chapman, Mrs. Mae Bozeman
Chase, Mrs. Clara Bozeman

Chase, E. L. Bozeman
Chavelaut, Horace A. Norris
Cheney, Harold, H. Belgrade
Clark, Mrs. H. G. Bozeman
Clarkson, Robert Malta
Cline, W. H. Bozeman
Cobleigh, Mrs. Esther R. Bozeman
Combs, Charles Lincoln, Neb.
Conkling, Mrs. L. D. Bozeman
Cook, George H. Bozeman
Cooley, Mrs. F. S. Bozeman
Cooley, Mrs. R. A. Bozeman
Cornish, Vivian Bozeman
Cornue, Harry E. Winnett
Courtney, Mrs. Dora Belgrade
Covington, C. C. Augusta
Croslin, Lawrence Bozeman
Croslin, Mrs. Mamie Bozeman
Davis, C. C. Great Falls
Davis, R. E. Willow Creek
Davis, Mrs. William Bozeman
DeAtley, G. K. Clyde Park
DeAtley, Mrs. G. K. Clyde Park
DeVries, L. Roberts
Dickover, Alvin C. Billings
Douthett, L. F. Big Timber
Duncan, Mrs. Scott Bozeman
Dusenberry, Bert L. Bozeman
Easton, Ed Bozeman
Eberl, John H. Clemons
Ecton, Delphia Bozeman
Edwards, A. B. Harlowton
Edwards, Georgia Harlowton
Edwards, L. E. Harlowton
Edwards, Mabel M. Harlowton
Eggen, Charlie Sandford Absarokee
Eggen, Ole, ... Absarokee
Eiker, Mrs. Elmer Huntley
Farnum, Charles E. Harlem
Farnum, Mary L. Harlem
Fitzgerald, James Salesville
Fitzsimmons, Mrs. I. S. Bozeman
Fletcher, Mrs. Charles E. Fort Shaw
Frank, Sol Livingston
Franks, George B. Cardwell
French, Edd A. Billings
Fullerton, W. L. Bozeman
Gaches, Harry W. Angela

Garnett, J. E. Willow Creek
Gordon, W. R. Townsend
Gow, Arthur Big Timber
Graves, F. F. Whitehall
Gunby, T. A. Maudlow
Haight, Thomas Howard Great Falls
Hampton, Sam J. Edwards
Hannah, W. J. Big Timber
Harmon, W. E. Bozeman
Hartman, Mrs. W. J. Bozeman
Hearn, Olga A. Red Rock
Henderson, S. F. Menard
Hershberger, John W. Hysham
Hission, D. D. Hysham
Hoffman, Mrs. J. A. Bozeman
Hoffman, Ruth Bozeman
Hollingsworth, Mrs. William Bozeman
Hough, B. G. Belgrade
Hough, Cora Belgrade
House, William H. Bozeman
Houston, Mrs. E. L. Bozeman
Howard, John M. Bozeman
Hudson, Albert N. Norris
Hudson, C. W. Norris
Hudson, Francis L. Alder
Hudson, N. R. Livengood, Alaska
Hunt, Mrs. M. F. Bozeman
Ingram, George F. Helena
Irvine, William L. Pipestone Springs
Jackson, Joel C. Harrison
James, George W. Wibaux
Jones, William Henry Columbus
King, George D. Whitehall
King, Mrs. Minnie Noble Whitehall
Kirk, Grace Bozeman
Kirk, Thomas S. Bozeman
Kleven, Mrs. Lena Bozeman
Knowles, Ferdinand F. Hunters Hot Springs
Korslund, Mrs. C. Bozeman
Kyle, Charles Jefferson Island
Lachapelle, Ulric A. Logan
Lane, Mrs. Eliza C. Hartford, Conn.
Law, Mrs. B. B. Bozeman
Lawshe, Ben B. Aberdeen, S. D.
LeClair, Mrs. Bernard Bozeman
LeClair, Mrs. Earl Kenwick, Wash.
Lenthold, J. H. Park City
Lewis, Frank E. Park City

Lewis, G. M. Manhattan
Lichtwardt, Bart H. Helena
Linfield, Mrs. F. B. Bozeman
Livingston, Mildred B. Bozeman
Lovely, C. M. Clyde Park
McLeod, Mrs. David Bozeman
Malimborg, Alfred Bozeman
Marble, J. T. Bozeman
Marble, Theodosia Bozeman
Marshall, George W. Menard
Martin, Mrs. G. L. Bozeman
Mead, I. P. Huntley
Melvin, James Billings
Mendenhall, D. W. Glendive
Metcalf, J. C. Bozeman
Metcalf, Louis E. Bozeman
Miles, George C. Bozeman
Moore, Mrs. E. J. S. Bozeman
Moore, E. J. S. Bozeman
Morse, C. H. Mink
Morton, H. Q. Bozeman
Murane, W. M. Columbus
McBroom, C. C. Bozeman
McDonald, S. E. Helmville
McKearnan, John B. Bozeman
McKellips, T. J. Commanche
McSeer, J. W. Bozeman
McVey, Mrs. W. B. Bozeman
Nagel, A. F. Park City
Nelson, Mrs. Henry Belgrade
Nelson, Henry Belgrade
Newell, Mary Lewistown
Newkirk, F. M. Jefferson Island
Olsen, A. J. Lewistown
Olsen, Antoinette Plentywood
Olson, Mrs. John Bozeman
Parker, Mrs. P. M. Bozeman
Parker, Mrs. Ralph R. Bozeman
Pearson, E. A. Bozeman
Pearson, Sadie I. Bozeman
Peets, John M. Bozeman
Penwell, Florence Belgrade
Pickens, L. W. Huntley
Pim, Mrs. Harry Fallon
Pinckney, Mrs. R. M. Bozeman
Potter, W. J. Bozeman
Powell, Mrs. G. J. Bozeman
Pruitt, A. D. Bozeman

Quinn, Mrs. E. J. Bozeman
Ramsland, M. P. Red Lodge
Ramsland, Mrs. M. Red Lodge
Rastad, Isaac Big Timber
Reed, D. A. Bozeman
Reinig, George I. Belgrade
Renzema, John W. Columbus
Reynolds, Lucille W. Helena
Rheem, L. M. Helena
Rheem, Mrs. L. M. Helena
Rhodes, Will M. Sheridan
Rice, Percy Wilsall
Riley, Mrs. E. H. Bozeman
Roberts, Chester Park City
Roberts, W. H. Bozeman
Robinson, Mrs. W. M. Bozeman
Rosenow, A. C. Billings
Rouse, Harold Bozeman
Rust, Mary Agnes Bozeman
Rutledge, Mrs. A. T. Bozeman
Schurrer, Marcus J. Clyde Park
Schurrer, Mrs. M. J. Clyde Park
Scott, Ethel Pierce Roundup
Schoppe, Mrs. W. F. Bozeman
Seeley, Mrs. T. G. Bozeman
Selway, Mrs. Mark M. Bozeman
Shannon, J. M. Twin Bridges
Sheridan, Albert D. Wilsall
Sheridan, Mrs. A. D. Wilsall
Shoemaker, James A. Billings
Shreve, B. F. Decker
Skank, J. C. Salesville
Stillman, A. Z. Salesville
Spaulding, Mrs. G. W. Bozeman
Spring, L. H. Portland
Smith, Rev. Edward Bozeman
Smith, Mrs. Edward Bozeman
Smith, Mrs. Eva Townsend
Smith, Kirk Chadburn
Stevenson, Thomas F. Bozeman
Stiff, Mrs. Noah Bozeman
Stimbach, Henry A. Stearns
Story, Ralph Park City
Switzer, Madge Bozeman
Sylten, Harris H. Absarokee
Taylor, Mrs. Ceylon B. Bozeman
Taylor, L. B. Chinook

Thompson, Walter C. Wilsall
Thorfinnson, M. A. Chinook
Townsend, George E. Manhattan
Tytler, Lyle C. Bozeman
Van Horn, Mrs. O. B. Bozeman
Walker, Mrs. E. E. Bozeman
Walrath, Alice Bozeman
Walrath, A. J. Bozeman
Walrath, Mrs. Harriet E. Bozeman
Wheeler, Bruce Valier
Wheeler, Wayne W. Great Falls
Whitcomb, Mrs. W. O. Bozeman
White, Wilfred W. Missoula
Williams, Franas M. Willow Creek
Williams, Lucinda J. Willow Creek
Willard, D. E. St. Paul, Minn.
Wills, John M. Red Lodge
Wilson, G. W. Billings
Willson, Mrs. Glenn Bozeman
Willson, Helen Fisher Bozeman
Wilson, Kathleen Harlowton
Wilson, Mrs. M. R. Bozeman
Wirth, C. A. Laurel
Woltermann, Gerhart Columbus
Wood, Earl G. Fairfield
Wood, Mrs. Earl G. Fairfield
Wylie, John M. Bozeman
Yates, L. P. Lismus
Yergey, Alford Bozeman
Zehntner, Robert White Sulphur Springs

Summary of Registration

	1916-17			1917-18		
	Men	Women	Total	Men	Women	Total
Graduate Students	2	0	2	1	3	4
Graduate Students not Candidates for degrees	1	2	3	11	9	20
College of Agriculture	88	0	88	57	0	57
College of Engineering	103	1	104	94	1	95
College of Applied Science	24	9	33	26	13	39
College of Household and Industrial Arts	18	111	129	20	134	154
Vocational Education	0	0	0	2	0	2
School of Home Economics	0	31	31	0	22	22
School of Mechanic Arts	56	0	56	65	0	65
School of Agriculture	125	0	125	89	0	89
School of Music	19	94	113	27	90	117
Total	436	248	684	392	272	664
Summer Session	11	60	71	0	176	176
Ministers' Week	43	0	43	38	0	38
Farmers' Week	223	76	299	166	112	278
Total	713	384	1097	596	560	1156
Counted Twice	16	51	67	10	41	51
Grand Total	697	333	1030	586	519	1105

SUMMARY BY COUNTIES AND STATES

Beaverhead County	16
Big Horn County	12
Blaine County	9
Broadwater County	11
Carbon County	28
Carter County	4
Cascade County	55
Chouteau County	12
Custer County	15
Dawson County	5
Deer Lodge County	15
Fallon County	5
Fergus County	27
Flathead County	46
*Gallatin County	344
Granite County	5
Hill County	9
Jefferson County	28
Lewis and Clark County	57
Lincoln County	5
Madison County	23
Meagher County	5
Missoula County	13
Musselshell County	8
Park County	36
Phillips County	2
Powell County	5
Prairie County	5
Ravalli County	17
Richland County	5
Rosebud County	11
Sanders County	10
Sheridan County	10
Silver Bow County	28
Stillwater County	28
Sweet Grass County	15
Teton County	34
Toole County	7
Valley County	18
Wheatland County	14
Wibaux County	2
Yellowstone County	56
Total Montana	1060
Other States	45
Grand Total	1105

*Note—The 344 Students from Gallatin County were enrolled in the college as follows:

College Courses	114
Secondary Courses	24
School of Music	27
Farmers' Week	142
Summer Session	26
Ministers' Week	11
	344

Alumni

With Their Years, Degrees and Present Addresses and Occupations.

Abell, Tracy H., B. S., 1915; Instructor in Horticulture, Utah Agricultural College Logan, Utah.

Alderson, Myrtle, B. S., 1913; Mrs. J. H. Griswold, Bozeman Bontana.

Allen, Elbert, B. S., 1903; Attorney, Livingston, Montana.

Allen, Mollie, B. S., 1916; Instructor in Domestic Science, Butte High School Butte Montana.

Alward, Mary L, B. S., 1908; Teacher in Gallatin County High School, Bozeman, Montana.

Annin, James T., B. S., 1911; Military Service, Camp Lewis, American Lake, Washington.

Baker, Florence. B. S. 1912; Deceased.

Baker, Harold E., B. E. E., 1907; Superintendent Electric Power Company, Naches, Washington.

Bancroft, Raymond E., B. S., 1911; Horticultural Inspector, Billings, Montana.

Barnard, Robert B., B. S. 1910; C. M. & P. S. R. R. Electrification Department, Seattle, Washington.

Batch, Otto, B. S. 1916; Homesteader, Mitchell, Montana.

Bell, James C., B. S., 1911; Graduate Student Oregon Agricultural College, Corvallis, Oregon.

Beerstecher Ada, B. S., 1917; Graduate Student, John Hopkins University, Baltimore, Maryland.

Benton, Ralph B.. B. S., 1906; United States Bureau of Biological Survey, Los Angeles, California.

Blankenship, E. V., B. S., 1897; Farmer, Bozeman, Montana.

Blessing, John, B. S. 1912; Farmer, Lewistown, Montana.

Bole, Margaret. B. S., 1913; Printer, Bozeman Daily Chronicle Office, Bozeman, Montana.

Bole, William S., B. S., 1906; Physician and Surgeon, Bozeman, Montana.

Booker, Clinton T. B. S., 1911; Superintendent Great Falls and Missouri River Sub-stations, Montana Power Company, Great Falls, Montana.

Border, Ernest. B. S., 1916; Instructor in Agriculture, Gallatin County High School, Bozeman, Montana.

Borthwick, Alberta. B. S., 1916; Dean of Women, Polytechnic Institute Billings, Montana.

Brabrook. Ralph, B. S., 1913; Directing Department, American Bridge Company, Chicago. Illinois.

Breneman, Annie T., B. S., 1907; Instructor in Mathematics, Montana State College, Bozeman, Montana.

Brewer, Lucille, B. S. 1909; Assistant Professor of Home Economics, Cornell University, Ithaca, New York.

Brook, Thomas B., B. S., 1913; Working in Garage, Twin Bridges, Montana.

Brooks, Roland, B. S., 1915; Farm Loan Representative, The Banking Corporation of Helena, Choteau Montana.

Brown, Archie S., B. S., 1910; Military Service, Electric Expert, United States Navy, Mare Island Navy Yards, San Francisco, California.

Brown, Edith E., B. S., 1904; Mrs. John Milloy, Regina, Sask. Canada.

Buckley, Thomas W., B. S., 1914; Civil Engineer, Manhattan, Montana.

Bull, Edna B. S., 1909; Mrs. G. W. Kirscher, Townsend Montana.

Bull, Frieda M., B. S., 1907; M. S., 1909; Long Beach, California.

Bullock, Fred, B. S., 1917; Assistant Grain Standardization Bureau, Minneapolis, Minnesota.

Burke, Edmund, B. S., 1907; Chemist and Meteorologist, Montana Agricultural Experiment Station, Bozeman, Montana.

Burket, Alonzo D., 1915; Chemist, Three Forks Portland Cement Company, Trident, Montana.

Butter, Donald, B. S., 1909; Electrical Engineer General Electric Company, Schenectady, New York.

Caldwell, Thomas O., B. A. C., 1899; Lewistown, Montana.

Cannon, Raymond E., B. S., 1917; Teacher Agricultural High School, Glasgow, Montana.

Carmichael Effie, B. S., 1910; Mrs. Vergil A. Spicer, Red Oak Iowa.

Carr, Irene H., B. S., 1911; Mrs. Claude Meserve, North Brighton, Me.

Carr, M. L., B. S., 1917; Military Service, 2nd Lieutenant, U. S. R. 166 Depot Brigade Camp Lewis, Washington.

Chaffee, Sarah, B. S. 1906; Mrs. Rudolph Beseke, Pullman, Wash.

Chestnut, Lula, B. S., 1916; Teacher of Home Economics in High School, Havre, Montana.

Clark, Ben A., B. S., 1911; Farmer, Springdale Montana.

Clark, Grace, B. S. 1911; Missionary Old Umtali, Rhodesia, Africa.

Clark, Olive, B. S., 1913; House Director Hamilton Hall, Bozeman, Montana.

Clarkson, Robert, B. S., 1917; County Agent, Malta, Montana.

Cockrel, Irvin, B. S. 1900; Osteopath Physician, New York City.

Coffey, Hazel C., B. S., 1915; Instructor in Home Economics, Montana Wesleyan, Helena, Montana.

Cole, E. Lester, B. S., 1917; Military Service, 2nd Lieutenant Sanitation Corps, American Lake Washington.

Collins, Walter E., B. S., 1902; Attorney and Trust Officer, Daly Bank and Trust Company, Butte, Montana.

Cook, Charles W., B. S., 1917; Board of Fire Underwriters, Butte, Montana.

Cook Donald H., B. S. 1917; Instructor in Chemistry, State College, New Mexico.

Cook, George, B. S., 1912; Farmer, Bozeman, Montana.

Cooke, Amy, B. S., 1908; Mrs. George Ambrose, Mackey, Idaho.

Cooley, Esther Belle, B. S. 1916; Instructor in Home Economics, State Normal School, Winona, Minnesota.

Cotner, Victor, B. S., 1916; Civil Engineer, Lovell, Wyoming.

Cowan, Lewis B. C. E., 1904; Civil Engineer, Bozeman, Montana.

Cullum, Georgia, B. S., 1914; Mrs. George Roosevelt, Home Demonstration Agent, Gallatin County, Bozeman, Montana.

Dahl, Hilmar, B. S., 1916; Military Service, Co. 17, 161 Depot Brigade, American Lake, Washington.

Daly, Freeman, B. S., 1912; Civil Engineer, Choteau Montana.

Davidson, Lyndall P., B. S., 1915; Military Service, 2nd Lieutenant Signal Corps, San Antonio, Texas.

Davidson, Mary E., B. S., 1910; In Settlement Work. Chicago Illinois.

Dawes, Rhoda, B. S., 1913; Mrs. Arthur Seamans, Huntley, Montana.

DeCamp, Renan, B. S., 1917; Military Service, Signal Corps, Carnegie Institute Pittsburg, Pennsylvania.

DeMuth, David R., B. S., 1910; Deceased.

DeMuth, Maude S., B. S., 1907; Mrs. W. D. Tallman, Bozeman, Montana.

Donaldson, Noble C., B. S., 1912; Assistant in Grain Investigation of United States Department of Agriculture, Moccasin, Montana.

Douglas, Stanley B. S., 1913; Montana Power Company, Canyon Ferry, Montana.

Draper, Charles H., B. S., 1912; Editor Carbon County Journal, Red Lodge, Montana.

Driscoll, William J., B. S., 1908; Civil Engineer, Lawrence, Massachusetts.

Duquette, Jay, B. S. 1917; Engineer. Montana Power Co., Hebgen Dam, Norris, Montana.

Dusenbury, Inez, B. S., 1912; Teacher, Bozeman, Montana.

Eberle, Alfred M., B. S., 1915; Manager, Dan C. McKay Stock Ranch. Willard Montana.

Eckles, Mildred A., B. S., 1914; Instructor in Home Economics, Fort Benton, Montana.

Edsall, William, B. S., 1911; Military Service, Junior Lieutenant, Ordnance, France.

Edwards, Timothy, B. S., 1909; County Surveyor. Oro Fino, Idaho.

Edwards, Margaret, B. S., 1912; Red Cross Service, France.

Ellis, Edward M., B. S., 1911; General Electric Company, Los Angeles, California.

Everett, Inez, B. S. 1914; Mrs. Ed Schimmele, Pine City, Minnesota.

Fisher, Charles, M. B. S., 1908; Electrical Engineer, Washington Water Power Company, Spokane, Washington.

Fisher, Helen, B. S., 1910; Mrs. Fred Willson. Bozeman, Montana.

Fiske, John M. B. S., 1915; General Electric Company, Lynn, Massachusetts.

Flager, Harold J., B. E. E., 1907; Military Service, Company C, 166 Depot Brigade, France.

Flager, Howard A., B. E. E., 1906; Military Service, Company F, 161 Infantry, France.

Flager, Ruth B. S., 1910; Mrs. Carl Widener, Bozeman, Montana.

Flaherty, Charles C., B. C. E., 1904; Farmer, Cold Springs, Montana.

Flanders, Clara M., B. S., 1914; Mrs. William Vestal. Spokane, Washington.

Fletcher. Elizabeth M., B. S., 1916; Teacher of Home Economics, Manhattan, Montana.

Ford, Arthur, B. S., 1916; Mechanician T. C. Powers Garage, Helena, Montana.

Foster, Florence B. S., 1896; Mrs. Burton Flemming, Iowa City, Iowa.

Fowler Edith E., B. S., 1917; Instructor in Home Economics, Deer Lodge, Montana.

Fowler, Viola, B. S., 1915; Stenographer, Bozeman, Montana.

Fox, Hazel, B. S., 1910; Mrs. Bryam Mayfield, Enterprise, Oregon.

Fox, Arthur P., B. S., 1917; Military Service Company 348, Field Artillery, American Lake, Washington.

Freeman, Beatrice B., B. S., 1900; Mrs. Thomas Davis, Teacher, Absarokee, Montana.

Freeman, William B., B. S., 1903; Consulting Engineer, Denver, Colorado.

Froebe, Frank J., B. S., 1911; Montana Power Company, Helena, Montana.

Gardiner, Henry C., B. S., 1903; Veterinarian and Agriculturist, Anaconda Copper Mining Company, Anaconda, Montana.

Garvin, John P., B. S., 1917; Military Service 2nd Lieutenant, American Lake, Washington.

Goodson Anna, B. S., 1915; Mrs. Glenn Willson, Bozeman, Montana.

Gordon Fred E., B. S., 1913; Assistant Manager Land Department, Anaconda Copper Mining Company, Anaconda, Montana.

Gottschalck, Carl, B. S., 1909; M. S., 1910; Graduate Student, John Hopkins University, Baltimore, Maryland.

Gray Florence E., B. S., 1915; Instructor in Mathematics, Libby Montana.

Gray, Wilson, B. S., 1915; Aviation Corps, San Antonio, Texas.

Gray, John Wright, B. S., 1917; Instructor in Agriculture, High School, Belt, Montana.

Griffith, Warren J., B. E. E., 1907; Chief Electrician Clemmer Theater, Spokane, Washington.

Grimes, W. Walter, B. S., 1915; Military Service, 129 Aero Squadron Kelly Field, South San Antonio, Texas.

Hagerman, Edna, B. S., 1912; Mrs. P. A. Hiemlich, Great Falls, Montana.

Haines, William T., B. S. 1911; Military Service, Instructor Radio Telegraphy Aviation Service, Cambridge, Massachusetts.

Ham, Frank W., B. S., 1903; M. S. 1905; Professor of Physics, Montana State College, Bozeman, Montana.

Hamilton, Everett A., B. S., 1911; Chief Operator Madison River Power Company Norris, Montana.

Hansen, Charles L., B. S., 1914; Assistant Agronomist, Experiment Station, Bozeman, Montana.

Hansen, Waldemar, B. S., 1917; Military Service, Washington College of Engineering Corps, Washington, D. C.

Harmon, Ella M. B. S., 1914; Instructor in Home Economics, Fergus Public Schools, Lewistown, Montana.

Hartman, Brooke, B. S., 1913; Military Service, Company A, 346 N. C. H. Machine Company P. N. B. Battalion, Camp Lewis, Weshington.

Hartman, June, B. S., 1910; Instructor in Music Montana State College, Bozeman, Montana.

Hartman, Lois K., B. S., 1907; Teacher of Spanish, High School, Elliott Hall, Tacoma, Washington.

Hartman, Ruth B. S., 1913; La Barthe Pianoforte Schools, Chicago, Illinois.

Hartman, Will, B. S., 1908; City Engineer, Livingston, Montana.

Hawkins, P. H., M. S., 1903; Banker, Absarokee, Montana.

Heageney, William F., Field Agriculturist Great Western Sugar Beet Company, Lovell, Wyoming.

Heighton, Pearl A., B. S., 1914; Mrs. B. A. Roll, Choteau, Montana.

Henderson, Charles F., B. S., 1910; Westinghouse Electric Company, Pittsburg, Pennsylvania.

Henderson, Lisle, B. S., 1909; Electrical Engineer, Montana Reservoir and Irrigation Company, Helena, Montana.

Higgins, Lucille, B. S., 1911; M. S., 1912; Mrs. S. W. Norton, jr., Teacher, High School, Spokane, Washington.

Hill, Lewis L., B. S., 1914; Military Service, 1st Lieutenant U. S. Army.

Hind, Bert S., B. S., 1909; Superintendent, Madison River Power Plant, Thompson Falls, Montana.

Hinman, Ruth, B. S., 1912; Teacher of Science, Three Forks, Montana.

Hodgskiss, John E., B. S., 1912; M. S., 1913; Farmer, Choteau, Montana.

Hodgskiss, Ursula, B. S., 1917; Teacher of Home Economics in Polytechnic Institute, Polytechnic, Montana.

Hodgskiss, William L., B. S., 1912; M. S., 1913; Farmer, Choteau, Montana.

Hollier, Georgia, B. S., 1915; Stenographer, Bozeman, Montana.

Homann, Fred C., B. S., 1916; Instructor in Machine Work, Montana State College, Bozeman, Montana.

Hutton, Fred, B. E. E., Deceased.

Ingram, Craig, B. S., 1917; General Electric Company, Schnectady, New York.

Jackson, Joel, B. S., 1917; Farmer, Harrison, Montana

Jacobs, Edward B., B. S., 1916; Military Service, 38th Company, 10 Bn., 166 Depot Brigade, Camp Lewis, Washington.

Jacobs, Lillian, B. S., 1910; Mrs. Arie DeGroot, Three Forks, Montana.

Jaeckel, Carl, B. S., 1917; U. S. Geological Survey, Raton, New Mexico.

James, John S., B. S., 1909; Engineer, Montana Reservoir and Irrigation Company, Cascade, Montana.

Jones, Kyle, B. S., 1912; Graduate Student State University, Missoula, Montana.

Jones, Ray S., B. S., 1915; Military Service, 1st Lieutenant U. S. A., American Lake, Washington.

Jones, Wyatt Wagner, B. S., 1901; M. S. 1902; Plant Pathologist for American Smelting & Refining Company, Salt Lake City, Utah.

Jorgensen, Ralph, B. S., 1917; Stockman, Fox, Montana.

Kelley, Martin, B. S., 1916; Assistant City Engineer, Anaconda, Montana.

Kelley, Jeanette, B. S., 1917; Home Demonstration Agent, Stillwater County, Columbus, Montana.

Kenck, Max W., B. S., 1914; Farmer, Silverbow, Montana.

Kennard, Eveleen M., B. S., 1915; Mrs. Alfred Eberle, Willard, Montana.

Kennedy, Cyril C., B. S., 1910; Deceased.

Kiefer, James A., B. S., 1914; Instructor in Physics, Montana State College, Bozeman, Montana.

Kimpton, Addie, B. S. 1910; Mrs. James H. Conrad, Wilsall, Montana.

King, Lowell, B. S., 1904; Construction Engineer, Electric Railroad, Davenport, Iowa.

King, Ruby E., B. S., 1909; Mrs. George Hogan, Musselshell, Montana.

King, Willard V., B. S., 1910; Assistant Entomologist, United States Bureau of Entomology, New Orleans, La.

Kinney, Edward C., B. C. E., 1907; United States Reclamation Service, Dixon, Montana.

Kinsella, Olive, B. S., 1916; Teacher of Home Economics, St. Catherine College, St. Paul, Minnesota.

Kirk, Grace, B. S., 1911; Instructor in Home Science, Bozeman Public Schools, Bozeman, Montana.

Kirk, Mary E., B. S., 1906; Mrs. Ermine Potter, Corvallis, Oregon.

Kirscher, W. Guy., B. S., 1909; Manager of Flour Mill, Townsend, Montana.

Koch, Elers, B. S., 1901; Supervisor Forest Service, Missoula, Montana.

Kremer, William J., B. S., 1910; General Manager Pine View Irrigation Company, Ennis, Montana.

Kretlow, Mary P., B. S., 1917; Teacher Home Economics, East Helena High School, East Helena, Montana.

Ladenburg, Carl, B. S., 1917; Military Service, Company 12, 3rd Trn. Bn., Barracks 1573, Camp Grant, Illinois.

Lamme, Maurice A., B. S., 1903; Director of Geology and Mineralogy, Government University, Montevidio, Uruguay, S. A.

Langohr, Don, B. S., 1917; Florist, Bozeman Montana.

Lannin, Earl A., B. S., 1912; Electrical Engineer, Montana Power Company, Lewistown, Montana.

Leinard, Ford B., B. S., 1914; Farmer, Edwards, Montana.

Lescher, Taylor, B. S., 1916; Military Service, Company 1-1st Training Bn., Sect. 1, Depot Brigade, 80th Div. Camp Lee, Va.

Lessel, Erma, B. S., 1916; Graduate Student and Assistant in Chemistry, Columbia University, New York.

Lewis, Edna, B. S., 1903; Berkeley, California.

Linfield, Bertil, B. S., 1917; U. S. Geological Survey, Raton, New Mexico.

Livingston, Walter, B. S., 1910; With Montana Power Company, Bozeman, Montana.

Locke, Jerome G., B. C. E., 1908; C. E., 1910; President and General Manager of the Livingston Publishing Company. Livingston, Montana.

Lorentz, Floyd S., B. E. E., 1907; E. E., 1910; Electrician Anaconda Copper Mining Company, Great Falls, Montana.

Lott, Mortimer J., B. S., 1915; Farmer, Twin Bridges, Montana.

Lund, Janelle E., B. S., 1917; Assistant in Chemistry, Montana State College, Bozeman, Montana.

Luther, Edith W., B. S., 1917; Assistant State Board of Health Water Laboratory, Bozeman, Montana.

Luther, J. Glenn, B. S., 1912; Military Service, Sergeant, Company D, 4th Regiment Engineers, Camp Green, North Carolina.

Mackay, Warren, B. S., 1913; Draughsman, Anaconda Copper Mining Company, Anaconda, Montana.

Malsor, Roy E., B. S., 1915; Military Service, Camp Lewis, American Lake, Washington.

Manning, J. M. W., B. S., 1917; Military Service, 2nd Lieutenant, Company G., 363 Infantry, American Lake, Washington.

Martin, Claude A., B. S., 1914; Civil Engineer, Great Northern Railway, Great Falls, Montana.

Maynard, Edna, B. S., 1900; M. S., 1903; Mrs. Garfield T. Morris, Alemeda, California.

Metheney, Blanche, B. S., 1911; Mrs. Ralph Kuschke, Billings Montana.

Miewald, Ethel, B. S., 1916; Teacher of Domestic Science and English. Chinook, Montana.

Milburn, George R., B. S., 1916; Military Service, American Exp. Force Aviation Section Signal Corps, France.

Millegan, Homer D., B. S., 1914; Farmer and Stockgrower. Millegan, Montana.

Millegan, Guy J., B. S., 1912; Farmer and Stockgrower, Millegan, Montana.

Milnor, Estelle, B. S., 1917; Assistant in State Board of Health Water Laboratory, Bozeman, Montana.

Monforton, Zoe, B. S., 1901; Mrs. H. C. Patterson, National City, California.

Monson, William, B. S., 1917; Deceased.

Moore, Ellie J., B. S., 1901; Farmer and Insurance Agent, Bozeman, Montana.

Morgan Carl F., B. S., 1915; Farmer, Joliet, Montana.

Morgan George W., B. S., 1912; Assistant in Dry Land Agriculture, U. S. D. A., Havre, Montana.

Morgan, Joseph D., B. S., 1912; Assistant Grain Standardization Bureau, United States Department of Agriculture, New Orleans, La.

Morgan, Oliver P., B. S., 1896; Deceased.

Morris, Harry Elwood, B. S., 1909; Assistant Botanist and Bacteriologist, Experiment Station, Bozeman, Montana.

Morris Garfield T., B. C. E., 1903; Senior Civil Engineer in the Valuation Department, Interstate Commerce Commission, Pacific Division, Alameda California.

Mountjoy, Agnes B. S., 1907; Mrs. Harry Mickelson, Opheim, Montana.

Mountjoy, Irvin, B. E. E., 1908; Farmer, Cardwell, Montana.

Myers, Ada Mae, B. S. 1915; Mrs. Jay Jacobs, Billings, Montana.

McCormack, C. E., B. S. 1916; Instructor in Agriculture, Helena Schools, Helena, Montana.

McCrea, John L., B. S., 1912; Deceased.

McIver, Grace F., B. S. 1917; Stenographer, Great Falls, Montana.

McSpadden, F. E. B. S., 1917; County Agent, Great Falls, Montana.

Nash, Lewis, B. S., 1904; Farmer, Clyde Park, Montana.

Noble, Edward G. B. S., 1915; Military Service, Aviation Corps.

Noble, Erma, B. S., 1909; M. S., 1910; Mrs. E. McCarthy, Townsend, Montana.

Noble, Ruth A., B. S., 1917; Mrs. E. E. Dawson, Great Falls, Montana.

Nordquist, Clark B. S., 1917; C. M. & St. P. R. R., Bozeman, Montana.

O'Connor William, B. S., 1916; Farmer, Red Lodge, Montana.

Osborne, Belle, B. S., 1907; Mrs. D. E. Fish, Mount Pleasant, Iowa.

Osenberg, Albert, B. S. 1916; Military Service, Signal Corps, San Antonio, Texas.

Papke, William C., B. S., 1915; Farmer, Bozeman, Montana.

Pease, Jay L., B. S., 1907; Farmer, Bozeman, Montana.

Peck Harry S., B. S., 1911; Electrical Engineer, Milwaukee Electrical Department, Butte, Montana.

Penwell. Clyde C., B. S., 1906; B. E. E., 1907; Farmer, Belgrade, Montana.

Penwell, Clyde W., B. E. E., 1909; Montana Power Co., Great Falls, Montana.

Peters Orville S., B. S., 1909; E. E., 1912; Assistant Physicist, Bureau of Standards, Washington, D. C.

Peterson James A., B. S., 1909; St. Paul Daily News, St. Paul, Minnesota.

Pettigrew, Leslie R., B. S., 1915; Military Service, Senior Lieutenant, Bancroft Hall U. S. Navy, Annapolis, Md.

Philpott, June, B. S., 1911; M. S., 1912; Head of Mathematics Department, Corvallis High School, Corvallis, Oregon.

Piedalue, Aimee M., B. S., 1915; Stenographer, Bozeman, Montana.

Piedalue Laura, B. S., 1912; Instructor in Home Economics, Helena High School, Helena, Montana.

Piedalue, Irene M., B. S., 1911; Visiting Housekeeper Houston Social Service Bureau, Houston, Texas.

Pool, Florence E., B. S., 1915; Home Economics, Extension Department, Agricultural College Fargo, North Dakota.

Pool, Louis K., B. S., 1910; City Engineer, Townsend, Montana.

Potter, Ermine L., B. S., 1906; Professor of Animal Husbandry, Oregon Agricultural College, Corvallis, Oregon.

Potter, John V., B. S., 1915; Military Service, 2nd Lieutenant, Ordnance, U. S. Army.

Quaw, Eugene, B. S., 1911; Playwright, Bozeman, Montana.

Quaw, Lucille, B. S., 1903; Teacher of English, Butte High School, Butte, Montana.

Quaw, Mignon B. S., 1902; Assistant State Leader of Home Demonstration Agents, Bozeman, Montana.

Quaw, Thomas B., B. S., 1907; Military Service, U. S. Army.

Rapatz, Eugene B. S., 1917; Military Service, Camp Lewis, American Lake Washington.

Reese, Herbert J., B. S., 1904; Military Service, U. S. Army, American Lake, Washington.

Richter, Frederick A., B. S., 1914; Military Service, Camp Joseph E. Johnston, Florida.

Riddell, Marsa B. S., 1916; San Francisco, California.

Robinson, J. W., B. S., 1908; Grain Buyer for McCaull-Dinsmore Company, Minneapolis, Minnesota.

Roecher, Rausie, B. S., 1914; Mrs. Selmer Solberg, Big Timber, Montana.

Romney, G. Ott, B. S., 1916; Instructor in English and Athletics, Billings High School, Billings, Montana.

Ronne, Edwin M., B. S., 1917; Military Service Aviation Field, Hampton, Virginia.

Sacket, Nathalie, B. S., 1913; Teacher High School, Livingston, Montana.

Sacket, Charles T., B. C. E. 1904; C. E. 1907; Military Service, U. S. Army

Sales, Reno H. B. S., 1898; Geologist, Anaconda Copper Mining Company, Butte, Montana.

Saltz, Lawrence W., B. S., 1917; Chemist Three Forks, Portland Cement Company, Trident, Montana.

Schabarker, W. W., B. M. E., 1902; Night Foreman, Shops Milwaukee Railroad, Milwaukee Wisconsin.

Schmidt, F. W., B. S., 1903; Mining Engineer, Sao Paulo, Brazil.

Scholten, Henry, B. S., 1917; Chemist Sugar Factory, Billings, Montana.

Schumacher, F. W., B. S., 1914; United States Forestry Service Deer Lodge, Montana.

Scott, Parke T., B. S., 1917; Military Service, 2nd Lieut., Camp Lewis, American Lake, Washington.

Seamans, Arthur, B. S., 1913; United States Government Experiment Service, Huntley, Montana.

Seamans, Howard L., B. S., 1916; Special Field Agent for Montana Bureau of Entomology, U. S. D. A., Bozeman, Montana.

Shaw, W. T., B. S., 1896; Unknown.

Shovell, William L., B. S., 1912; Horticultural Expert, Hamilton, Mont.

Sloan, J. Harvey, B. C. E., 1903; Public Service Commission, Madison, Wisconsin.

Sloan, W. F., B. E. E., 1903; Consulting Engineer, Madison, Wis.

Sloan, William Glenn, B. S., 1910; Military Service, France.

Smith, Alda, B. S., 1913; Mrs. Harold Clay, Charlotte, Michigan.

Smith, Inez, B. S., 1916; Instructor in Home Economics Gallatin County High School, Bozeman, Montana.

Snider, Leta, B. S., 1911; Mrs. James A. Peterson, St. Paul, Minnesota.

Snow, Manfred L., B. S., 1917; Assistant State Dairy Commissioner, Bozeman, Montana.

Solberg, Selmer H., B. S., 1914; Merchant, Big Timber, Montana.

Soper, Joseph, B. S., 1913; Fruit Inspector, San Diego, California.

Spain, J. Marvin, B. S., 1911; Homesteader, Edwards, Montana.

Spain, Whitfield, B. S., 1909; Manager, of Ranch, Belgrade, Montana.

Spragg, Frank A., B. S. A., 1902; Plant Breeder of Farm Crops, Michigan Experiment Station, Lansing, Michigan.

Stadler, Marie, B. S., 1916; Mrs. Marie Stadler Cowan, Orono, Maine.

Stafford, Lucy B., B. S., 1896; Mrs. William Peck, Pony, Montana.

Stahlford, Ruby, B. S., 1917; Instructor of Home Economics, Three Forks, Montana.

Stanley, Amelia, B. S., 1916; Assistant in Home Economics Great Falls High School, Great Falls, Montana.

Steel, David, B. S., 1916; Water Inspector for G. N. R. R., Great Falls, Montana.

Steel, Hamilton, B. S., 1915; Deceased.

Strand, A. Leroy, B. S., 1917; Special Field Agent for Montana Bureau of Entomology, U. S. D. A., Bozeman, Montana.

Sweat, Ruth, B. S., 1916; Instructor of Home Economics, Choteau, Montana.

Switzer, Madge, B. S., 1914; Instructor of Home Economics, Gallatin County High School, Bozeman, Montana.

Tavener, Frank, B. C. E., 1903; Consulting Engineer, Missoula, Montana.

Taylor, Emma, B. S., 1915; Instructor in Home Economics, Belgrade Schools, Belgrade, Montana.

Taylor, John C., B. S., 1912; Assistant County Agent Leader, Bozeman, Montana.

Thomas, David, B. S., 1917; Engineer, Valier, Montana.

Thompson, A. Paul, B. S., 1915; First Assistant Chemist Electrolytic Zinc Plant, Great Falls Reduction Works, Anaconda Copper Mining Company, Great Falls, Montana.

Thompson, Homer C., B. S., 1902; President Three Valleys Cooperative Association, Three Forks, Montana.

Thorpe, Elizabeth, B. S., 1907; Instructor of Mathematics, Salt Lake City, Utah.

Thorpe, Mabel A., B. S., 1907; Mrs. J. A. Thaler, Bozeman, Montana.

Tracy, Edna B., B. S., 1908; Mrs. John White, Bozeman, Montana.

Tremper, William G., B. S., 1911; Farmer, Baylor, Montana.

Truitt, C. Alonzo, B. S., 1915; Civil Engineer for Burns & McDonnell, Kansas City, Missouri.

Truman, Ida R., B. S., 1917; Assistant in Home Economics, State College, Bozeman, Montana.

Truman, Joseph K., B. S., 1913; Electrical Engineer, Montana Power Company, Canyon Ferry, Montana.

Undem, Louis, B. S., 1917; Military Service, 1 st Lieutenant, American Lake, Washington.

Vestal, William B., B. S., 1914; Engineer, Spokane, Washington.

Vreeland, Edna, B. S., 1909; Mrs. Robert K. Plues, Detroit, Michigan.

Wade, Arthur M., B. S., 1911; Milwaukee Railroad, Three Forks, Montana.

Walchli, Fred, B. S., 1910; Mechanical Engineer, Kalispell, Montana.

Walker, Cecil, B. S., 1916; Mrs. Walter Willson, Tuscon, Arizona.

Webster, Alden, B. S., 1914; Electrical Draftsman, Corps of Engineers, United States Army ,Washington, D. C.

Wells, Roscoe, M. S., 1917; Special Agent in U. S. D. A. Bureau of Entomology, Dallas, Texas.

Wharton, John C., B. S., 1913; Stock Business, Wisdom, Montana.

Whipple, Charles A., B. S., 1917; Deputy Land Appraiser, Helena, Montana.

Whiteside, John, B. S., 1917; Deceased.

Widener, Carl C., B. S., 1908; City Engineer, Bozeman, Montana.

Wilcomb, Maxwell, J., B. S., 1915; Assistant City and County Engineer, Livingston, Montana.

Wilcox, Guy M., B. S., 1917; Harvard University Graduate School of Commerce, Cambridge, Massachusetts.

Willey, Leroy, B. S., 1913; Dry Land Office, United State Department of Agriculture, Sheridan, Wyoming.

Williams, Frank B., B. M. E., 1899; Engineer, State School of Deaf and Blind, Boulder, Montana.

Williams, Roy B., B. S., 1911; Civil Engineer, Power, Montana.

Williams, Sidney A., B. S., 1911; Electrical Engineer, H. J. Heinz Company, Pittsburg, Pa.

Williams, Lee, B. E. E., 1902; County Surveyor and City Engineer, Deer Lodge, Montana.

Willson, Walter G., B. S., 1913; Westinghouse Electrical and Manufacturing Company, Tuscon, Arizona.

Wilson, Elva, B. S., 1909; Mrs. N. P. Nelson, Three Forks, Montana.

Wilson, Kathleen, B. S., 1915; Instructor in Home Economics, Harlowton High School, Harlowton, Montana.

Wolpert, Harold E., B. S., 1912; Working in Smelter, Mullen, Idaho.

Wylie Lawrence, B. S., 1913; Military Service, Instructor in Wireless, Post Field.

Wylie, Mary, B. S., 1910; Assistant County Superintendent of Public Schools, Bozeman, Montana.

Young, Mrs. Verna T., B. S. 1917; Home Demonstration Agent, Butte, Montana.

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